andamans

COASTAL AREA ASSESMENT

a post tsunami study on coastal conservation and regulation

ANDAMAN ISLANDS COASTAL AREA ASSESSMENT

A POST TSUNAMI STUDY ON COASTAL CONSERVATION AND REGULATION

EQUATIONS
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ANDAMAN ISLANDS

Coastal Area Assessment

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EXECUTIVE SUMMARY

Context of the study

This study was undertaken in the context of the tsunami of 26 December 2004, which was a grim reminder of the need to ensure the protection of coastal and island ecosystems and to revisit issues relating to legal and policy frameworks governing them. Both coastal and island ecosystems are ecologically fragile and extremely sensitive to the natural and anthropogenic activities affecting them. A number of relevant questions need to be addressed in the context of the tsunami and the series of events that followed. Primary among these are:

1. How can the integrity of coastal ecosystems be ensured and not compromised, given, on one the hand, the rehabilitation and reconstruction of affected communities, and on the other, the numerous development plans that have been chalked out by governments for different sectors?

2. Are the existing legal and policy frameworks and their processes adequate to regulate these activities?

3. What are the implications that natural disasters like the tsunami, pose for the implementation of legal and policy frameworks?

This study may be considered as a contribution to the ongoing debate and advocacy efforts with concerned individuals, groups and authorities to revisit the coastal area development debate and current legal and policy frameworks, specifically the Coastal Regulation Zone Notification, 1991 under the Environment (Protection) Act, 1986. EQUATIONS, having worked on impacts of tourism on communities and ecosystems, sees this study as an opportunity to revisit these issues in the particular context of tourism development, highlight concerns where we have been consistently attempting to influence tourism policy and its implementation.

Objectives of the study

The study was initiated with a set of short term and long-term objectives, which were;

Short-term objectives

a) Assess the extent of impact on human life, livelihoods, property and coastal and island ecosystems from an environmental perspective.
b) Assess the vulnerability of coastal and island ecosystems due to unplanned and unregulated development.
c) Collect preliminary information from the affected sites.
d) Examine violations of environmental laws and related matters thereof.

Long-term objectives

1. Document procedural lapses in permitting such activities.

2. Facilitate strengthening of existing legal frameworks to address unplanned development.

3. Critique development plans and activities on coasts and islands.

However, during the course of the study, the team was compelled to revisit some of them. In the short-term objectives, legal violations of environmental laws, which in this case are the Coastal Regulation Zone Notification, 1991, could not be established due to the ambiguity in the Notification regarding clearance mechanisms for projects. What would appear to be an "in-principle" violation may actually be a cleared project. Detailed and case-by-case investigations have to be undertaken for this. Therefore, this aspect of the Notification has not been dealt with in this study. In the long-term objectives, documentation of procedural lapses in allowing such activities was also not undertaken due to the aforementioned reasons. The study has been able to deal with address all other objectives reasonably well.

Activities & Report

This study was undertaken during the period March – December 2005. This assessment was undertaken by way of field visits, consultations with local individuals and groups, photo-documentation and compilation of secondary information and data. This investigation helped ascertain the extent of impacts on human lives, livelihoods, and ecosystems on the one hand, and to document and critique existing legal frameworks and development plans, especially tourism relating to coastal and marine systems in the Island group.

The results of this study reconfirm the biophysical and cultural uniqueness of the Andaman and Nicobar

Islands, however, they also point to the extremely fragility of these ecosystems in view of natural and anthropogenic perturbations affecting them. The extent of loss of human life and property especially in the Nicobar Islands demonstrate how large-scale natural disasters like tsunami can devastate small islands. The first section of this report contextualises the impact of the tsunami by describing the role and function of coastal and marine ecosystems in the Andaman and Nicobar islands. A detailed description of the various components of marine and coastal ecosystems in the Islands and the human activities impacting them are described in the introductory section are available in the appendices. This includes information on the distribution of coastal systems such as mangroves, wetlands and coral reefs, their ecological role and the anthropogenic activities and population densities reported from the districts and tehsils.

Part 2 of this report addresses how ongoing and planned reconstruction, rehabilitation and development activities need to be managed and presents an analysis of coastal conservation and regulation issues with respect to legislations and policies. The single overarching legislation for coastal areas, the Coastal Regulation Zone (CRZ) Notification, 1991 is examined in detail. Although proposed more that a decade ago, this notification is ambiguous and is yet to be fully implemented. The procedural lapses and loopholes regarding implementation of this legislation, problems with the jurisdictional scope and dilution of this Notification is also discussed in this context.

In Part 3, the impact of the tsunami in terms of loss to life and property are listed for districts as well as specific sites. Structural and geomorphological changes as well as impacts on various ecosystems including agricultural lands are assessed. The vulnerability of the island ecosystems to natural disasters is stressed upon especially in the light of these development activities. The challenges posed by reconstruction activities for implementation of CRZ Notification are analyzed here.

In Part 4 the study has closely examined tourism development plans among the various activities that are planned in the islands for economic development. This report examines impacts of tourism development in detail in this section. The existing tourism master plans are reviewed and specific recommendations are given on various aspects. Specifically, the A&N Administration is urged to examine this issue from all angles taking into consideration environmental, infrastructural, economic, and socio-cultural aspects and considering especially natural disasters such as cyclones, earthquakes and tsunami.

Finally, a number of specific recommendations have been put forth as a result of this study. For the Andaman and Nicobar islands, these include: planning effective reconstruction and rehabilitation measures without encroaching on ecologically sensitive areas (especially the CRZ I areas) or exhausting valuable natural resources (such as timber and sand), planning appropriate tourism strategies in tune with the environment, culture and carrying capacity of the islands, developing guidelines to strengthen the existing frameworks on coastal legislation, preservation of ecologically sensitive areas rich in biodiversity, discouraging the sand mining and timber extraction and the construction of harmful structures like sea walls, and renewed restrictions on constructions and conversion of land along the coast.

Recommendations

The key recommendations of this assessment are:

COASTAL ZONE MANAGEMENT

1. Demarcation of the HTL and the LTL needs to be done at the earliest.

2. The new maps and plans should also be widely distributed and made available at important offices for public examinations at all times and also posted on the official websites.

3. The ambiguity in functioning of A&NCZMA needs to removed by bringing into the public realm and disclosing practices they use to give clearances for projects.

4. The Inner Line Permit process needs to be put in place at the earliest.

5. The amendment to allow tourism projects beyond 50m of HTL should be revoked.

TOURISM

6. All existing tourism master plans and documents should be shelved and the form of tourism that would be sustainable for the islands needs to be reconsidered based on current contexts and developments, through participative processes. A

notification to this effect should be brought out for public information.

7. Tourism development should be in accordance with the order of the Supreme Court, based on the recommendations of the Shekhar Singh Committee report, which strongly emphasised very low permanent infrastructure based approach to tourism.

8. New areas should not be opened for tourism, including for ecotourism, unless proper impact assessment studies have been undertaken and made available for public scrutiny and intervention.

9. Current local tourism enterprise in Havelock and Neil needs to be regularized and supported.

10. Nicobar Islands should not be opened for tourism.

11. The Phuket – Port Blair tourism linking plans need to be terminated.

List of abbreviations

1.	A&N	Andaman & Nicobar Islands
2.	A&NCZMA	Andaman & Nicobar Coastal Zone Management Authority
3.	CD Block	Community Development Block
4.	CPCB	Central Pollution Control Board
5.	CRZ	Coastal Regulation Zone
6.	CZMA	Coastal Zone Management Authority
7.	CZMP	Coastal Zone Management Plan
8.	EIA	Environment Impact Assessment
9.	EP Rules	Environment (Protection) Rules
10.	EPA	Environment (Protection) Act (1986)
11.	GoI	Government of India
12.	HC	High Court
13.	HTL	High Tide Line
14.	ICZMP	Integrated Coastal Zone Management Plan
15.	LNG	Liquefied Natural Gas
16.	LTL	Low Tide Line
17.	m	metres
18.	MoEF	Ministry Of Environment And Forests
19.	MoPNG	Ministry of Petroleum & Natural Gas
20.	MoST	Ministry of Surface Transport
21.	MoT	Ministry of Tourism
22.	NDZ	No Development Zone
23.	NOC	No Objection Certificate
24.	SC	Supreme Court
25.	SCC	Supreme Court Cases
26.	SEZ	Special Economic Zone
27.	SPCB	State Pollution Control Board
28.	UoI	Union of India
29.	WP	Writ Petition

PART 1

INTRODUCTION

1.1. The Milieu

Coastal areas are subject to natural dynamics induced by processes such as low and high tides, land and sea breezes, the formation of sand dunes along beaches, the formation of sand bars and spits, frequent storms and cyclones and the occasional yet devastating tsunami. These ecosystems have the capacity to respond to changes and recover from such situations in the normal course, but this response is often affected and slowed down as a result of anthropogenic activities. A spanner is thrown in the system when human activities assume proportions beyond what coastal ecosystems can bear—in the form unplanned, unregulated and unfettered expansion of developmental activities and what are considered remedial activities or management measures, e.g. sea walls and coastal plantations of exotic species like casuarina.

As is the case in many parts of the world, the coastal areas in India are also densely populated. Apart from rural and urban settlements, coastal areas are the site of many kinds of industrial and infrastructure developments. Chemical and petrochemical industries, thermal power plants, aquaculture and tourism are the main industrial activities along the coastline. Not to mention all major and minor ports, harbours and jetties that dot the Indian coastline and islands of Andaman and Nicobar Islands and Lakshadweep. Defence and nuclear installations also favour coastal areas.

Coastal ecosystems such as estuaries, mangroves, wetlands, coral reefs and deep seas receive less attention in the form of policy and legal frameworks as compared to terrestrial ecosystems like forests. This is also evident from various laws and policies that govern forests nationally. Although some these would be applicable to specific sub-systems of coastal areas (e.g. mangrove forests come under the Wild Life (Protection) Act, 1972 and the Forest (Conservation) Act, 1980), the remaining coastal areas are to be governed by a single notification under the Environment (Protection) Act, 1986 — the Coastal Regulation Zone (CRZ) Notification, 1991.

1.2. The Tsunami and its Aftermath

Initial assessments carried out by the government as well as non-government and inter-governmental agencies emerged with similar findings — rehabilitate natural ecosystems; natural protective measures are preferred to artificial physical barriers; manmade barriers such as seawalls fragment habitats and would aggravate the impacts of tsunami by creating turbulence. Most of these environmental assessments are also critical and advocate better coastal management and land use strategies to reduce vulnerability and stress on coastal ecosystems.

It may not be possible to directly correlate the extent of tsunami linked damage to life and property to the volume of development on the coastal areas due to various factors in play, e.g. the time of the day, the proximity to coastline, etc. It may also not be possible to assess how vulnerable coastal ecosystems have become due to natural disasters because of high level of technical expertise and time required to undertake such assessments. At the same time, it is possible to deduce how haphazard and unrestricted developments have rendered coastal ecosystems vulnerable to undesired change. This is more pronounced in the case of coastal states such as Tamil Nadu and Pondicherry which suffered maximum damage (See figures 1 for general impacts of the tsunami in south Asia).

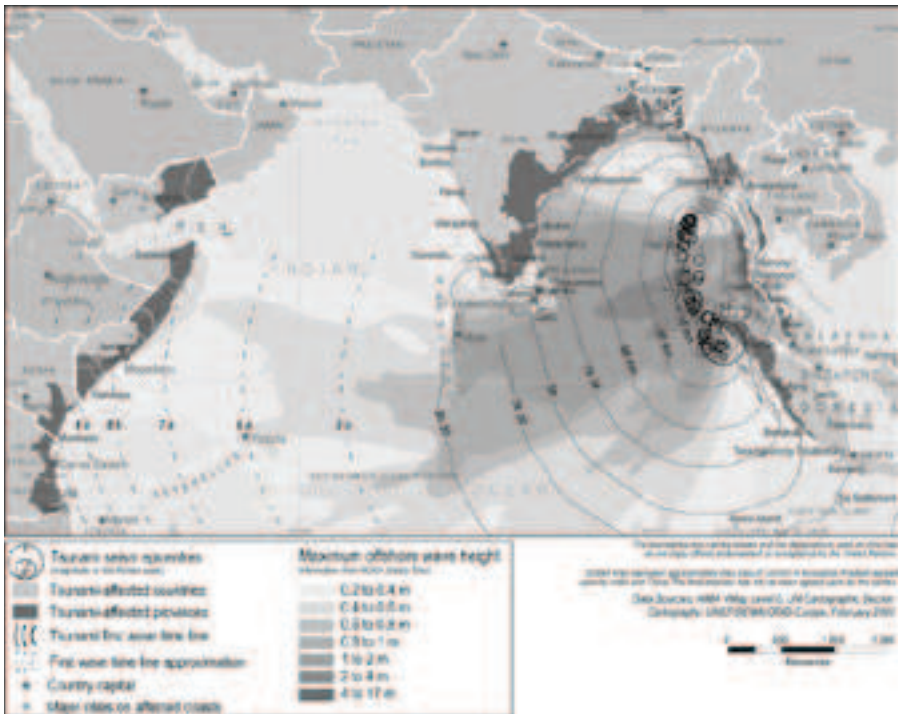
The tsunami has impacted coastal ecosystems to varying degrees. In the case of Andaman and Nicobar Islands, the tsunami coupled with earthquakes has drastically changed the landscape. The island groups have been lifted by a few metres in the northwest and subsided by a few metres in southeast. This has modified the perimeters and parameters of the islands. Studies and assessments conducted by competent agencies have established these crucial aspects in greater detail. At the same time, these changes pose challenges to the conservation of affected coastal areas and to rethink the form of development that can be proposed in these areas. It is worth reiterating that earlier development plans and management processes cannot be implemented in their current form, as is presented in the analysis of tourism development plans in this report.

The Coastal Regulation Zone (CRZ) Notification, 1991 was conceived to be a guideline that would influence all types of developmental activities on the coast, yet

it has not been fully implemented since its inception a decade and a half back. There are numerous violations of its philosophy, provisions and clauses. The Notification itself remains ambiguous as to its implementation (for e.g. the process of obtaining clearances for projects), although it lays down clearly what are permissible and non-permissible activities. Affected areas like Tamil Nadu and the Andaman and Nicobar Islands do not yet have an approved Coastal Zone Management Plan; almost a decade has passed since the Supreme Court deadline was given for submission and approval of these Plans. Developmental projects and activities seem to be taking place on an ad hoc basis. Even with all its shortcomings, the Notification remains as the only legal support for coastal conservation and regulation. Over and above this, legislations bring about policies and plans that contradict the principles of CRZ. In the context of tourism, it is important to study the wide range of lobbies that push for "certain kinds of developmental activities" that will have impacts on communities, livelihoods, ecology and development of sustainable tourism.

The need of the hour is to go back to the original philosophy of the CRZ Notification, take on board the contemporary challenges and rework its norms, provisions and regulatory measures. This study is an attempt in this direction.

Figure 1 : path of tsunami on time scale & magnitude of impact



Source: http://www.grid.unep.ch/product/map/images/indianocean_propwave.gif

1.3. Methods

1.3.1. Geographical Scope of the assessment

When the study was conceptualised in February 2005, it was expected that all island groups in the Andaman and Nicobar Islands that were affected would be studied. However, based on reports that were coming in from individuals and organisations working in the Islands, it was felt that an assessment in the Nicobars would not be feasible in terms of the time, effort and logistics. Additionally, the process of obtaining permits from the Andaman and Nicobar Islands Administration would have been time consuming and expensive as it would have involved the team members being stationed in Port Blair for extended periods of time. Furthermore, during this period a number of NGOs were already in the Nicobars doing assessments and involved in relief activities, and the administration was hesitant to issue more permits. Based on these factors and on the basis of the recommendations of our network partners in July 2005, the Nicobar group of islands was not covered in the present study. In addition to this, the Nicobar Islands have not witnessed as much development as Andaman Islands where coastal conservation and management pose challenges. Hence it was decided to concentrate only on the Andamans.

Spatial – Initially three areas were identified for the assessment in the Andaman group: Port Blair, Hut Bay and Havelock Island. However, based on the

team's assessment of the ground situation and after discussions in Port Blair with Mr. Samir Acharya of Society for Andaman and Nicobar Ecology (SANE), it was decided to include parts of North and Middle Andaman in the study. SANE is an NGO based in Port Blair that has been actively pursuing conservation and indigenous peoples' issues in the Andaman & Nicobar Islands.

THEMATIC: the following themes were covered for the purpose of the assessment:

1. Impact of the tsunami on human community and ecology and changing geomorphology of the islands. This included an assessment of both natural and man-induced factors affecting ecosystem health, dynamics and their impacts.

2. Reconstruction measures adopted and their quality, community structures and their response.

3. Development plans for various sectors, especially tourism and including others like fisheries and agriculture.

4. Status of implementation of legal frameworks (CRZ Notification).

The study was carried out through:

1. Collection of secondary information – statistics, development plans and status reports.

2. Rapid visual assessments by the study team which were discussed within the team and photo-documented to substantiate the observations.

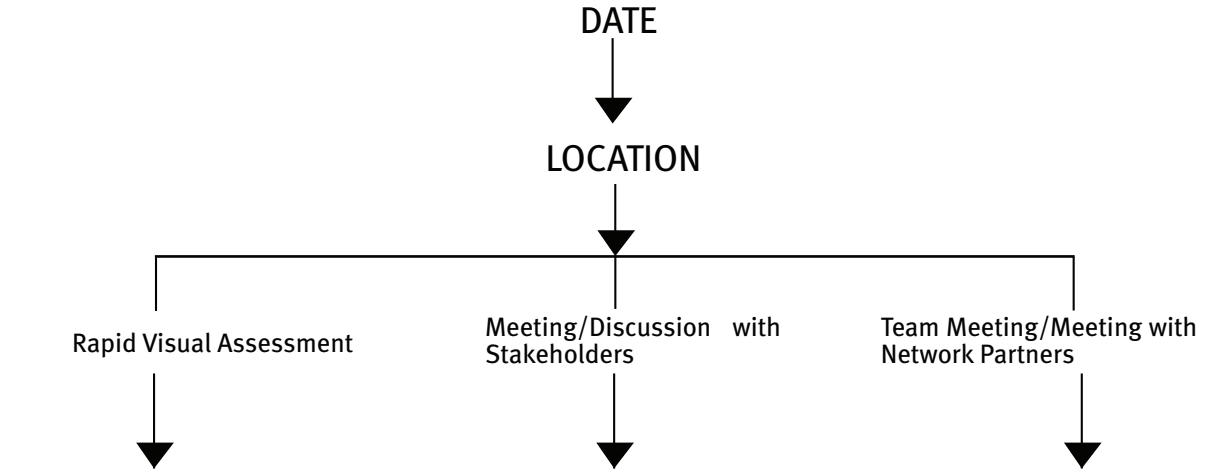
3. Discussions and meetings with various stakeholders in government departments, including the Lt. Governor and Chief Secretary, and other heads of departments (Environment, Forests, Fisheries, Collectorate and Social Welfare), the tourism industry and local people on specific issues.

4. Meetings and discussions with network partners and other civil society organisations working in the Islands.

The scheme of data collection is summarised in the flow chart alongside (Figure 3).

FIGURE 2 : ANDAMAN & NICOBAR ISLANDS

Figure 3: Field assessment process



Assessment of:

1. The extent of development (settlements/tourism/fisheries etc.) along the coastline and vulnerability of settlements and eco systems to natural disasters
2. The impact of the tsunami to coastal geomorphology, eco-system health and human settlements
3. The impact of reconstruction and rehabilitation work following the tsunami on coastal ecology and human settlements
4. The challenges in implementation of legal frameworks related to developmental activities and environmental protection e.g. the CRZ Notification, 1991
5. Photo-documentation

Discussion of:

1. Development plans for various sectors, especially tourism. Other sectors include fisheries and agriculture
2. The implementation of legal frameworks related to developmental activities and environmental protection
3. The development of human settlements along the coastline and related issues
4. Social, cultural and economic impacts of the tsunami
5. Social, cultural and economic impacts of tourism development

Discussion of:

1. Field survey logistics
2. Assessment Strategy
3. Debriefing meetings to discuss future strategy and action

1.3.2. Limitations of the Study

a) The study has been limited to the coastal areas of the Andaman Islands that are covered by the CRZ Notification. Recognizing that areas beyond the coastal regulation zone have an impact on coastal areas, the study was able to focus on coastal area issues only. Addressing other issues would have complicated analysis.

b) The study was done on the basis of information gathered from populated areas of Andaman Islands. The coastal areas of e.g. uninhabited islands and falling under the Jarawa reserve were also not covered.

1.4. Andaman & Nicobar Islands

The Andaman and Nicobar Islands is the largest archipelago in the Bay of Bengal. Aligned in a north-south direction, they comprise 572 islands, islets and rocks congregated into two major groups—the Andaman and the Nicobar groups. The Andaman group, which is located closer to Myanmar, consists of 550 islands, islets and rocks and covers a land area of 6408 km2. This group includes large islands such as the Middle Andaman, North Andaman, South Andaman, Baratang and Little Andaman. The Nicobar group consists of 22 islands having a total land area

of 1841 km2. Great Nicobar (the southernmost island of the Nicobar chain) is the largest island (1045 km2). The total area of the Andaman & Nicobar islands is 8249 km2 and the total length of islands' coastline is about 1962 km, accounting for about one fourth of the total coastline of India.

In November 1956 the A&N islands were constituted as a Union Territory of India and are administered by the President of India through the Lt. Governor whose head quarters is at Port Blair on South Andaman. Administratively, the Islands are divided into two districts i.e. the Andaman district and the Nicobar District[1]. Table 1 outlines the districts and further administrative subdivisions of the island group.

TABLE 1
ADMINISTRATIVE UNITS OF THE ANDAMAN AND NICOBAR ISLANDS

DISTRICT	SUB-DIVISION	C.D BLOCK	TEHSIL
Andaman	Mayabunder	North Andaman	Diglipur
		Middle Andaman	Mayabunder
			Rangat
	South Andaman	South Andaman	Port Blair
			Ferrargunj
Nicobar	Car Nicobar	Car Nicobar	Car Nicobar
	Nancowry	Nancowry	Nancowry

1.4.1. ANDAMAN ISLANDS

Topographically, the Andaman Islands are characterised by low range of hills and narrow valleys, except in the coastal stretches. The ranges are aligned in a north-south direction, but several spurs and ridges run off the main ranges in all directions. The slopes are moderate to steep, ragged and prone to erosion. Flat lands are comparatively scarce and confined to some of the larger valleys. The highest point in all the areas is Saddle Peak on North Andaman Island. It is at an elevation of about 800m above mean sea level.

There is no major perennial fresh water river in these islands except Kalpong in North Andaman. There are several rainfed streams that dry up during the summer. The coastline of these islands is wavy with large number of bays, lagoons and serpentine creeks.

The inland forest eco-system is characterised by the evergreen and semi-deciduous vegetation types. The Islands still have approximately 86% of original forest cover left, and probably another 10–20% has been degraded by human activities. (MacArthur and Wilson 1967 as quoted by ANET 2003). The area of mangroves in Andamans is 929 km².

The Andaman (and Nicobar) Islands have the last pristine reefs in the Indian Ocean region, and are emerging as one of the most important coral reef sites in the world. Coral reefs stretch over an area of 11,000 km² in the Andamans

The coral reefs of the islands are under various degrees of threat such as siltation, sand mining, agricultural runoff and damage due to fishing and tourism activities. These are apart from global climatic factors such as the rise in sea surface temperatures. The collection of shells and sea cucumbers for commercial purposes has led to their drastic decline. While they are protected now, the Department of Environment and Forests has not been given the additional resources necessary to enforce the ban on their collection.

The Andaman (and Nicobar) Islands harbour some of the richest and unique biodiversity in the world. The Islands are an internationally acknowledged hot spot for biodiversity, with over 3,552 species of flowering plants (with 223 endemic species), 5,100 species of animals (100 freshwater, 2,847 terrestrial, 503 endemic) and 4,508 marine species (of which 220 are endemic), 52 species of mammals (with 33 endemics), 244 species of birds (96 endemics) and 111 species of amphibians and reptiles (66 endemic) (Das 1994, 1997a, 1999; Andrews 2001). The islands also have a reported 197 species of corals, with about 80% of the maximum coral diversity found anywhere in the world. This makes them the richest coral reefs in the Indian Ocean and an area of global significance (Turner et al. 2001, Vousden 2001, quoted in Andrews and Sankaran 2002)[2].

[1] www.andaman.nic.in

[2] Dialogue April–June, 2003, Volume 4 No. 4, Conserving the Biodiversity in Andaman and Nicobar Islands, Dr. Vasumathi Sankar, Astha Bharati.

1.4.2. Threats to Biodiversity and Endemism

This endemism is due to the isolation from mainland Asia (Das 1999). Thus, considering the size and area of the islands, loss of habitat leading to extinctions will have far greater consequences in terms of the loss of genetic diversity than comparable areas elsewhere. A rough calculation using island biogeography theory indicates that with the area of forest down to 86% of what it used to be, about 4. 5% of species may have been lost.

Introduced species are a problem in the Andamans. Typical island introductions such as rats, dogs, and cats may be harming the endemic Andaman crake (Rallina canningi) (Stattersfield et al. 1998). Spotted deer (Axis axis) are now widespread throughout the Andamans, as is the African giant snail (Achatina fulica). Elephants (Elephas maximus) have been introduced to Interview Island and North Andaman.

1.4.3. Vulnerability & Impacts of Unplanned Development

The ecosystems of small islands such as the Andaman and Nicobar group are particularly vulnerable to factors affecting environmental setup of small island states. These include:

- Limited assimilative and carrying capacity, leading to problems associated with waste management, water storage and other factors affected by small territorial size.

- A relatively large coastal zone, in relation to the landmass, making these states especially prone to erosion.

- Fragile ecosystems, because of low resistance to outside influences, endangering endemic species of flora and fauna.

- Vulnerability to natural disasters, including earthquakes, volcanic eruptions, cyclones, hurricanes, floods, tidal waves and others–these disasters also affects larger territories, but the impact is more devastating on small islands.

- A relatively high proportion of land, which could be affected by climate change, and in particular a rise in sea level, possibly resulting in proportionately large land losses, particularly in low-lying areas.

- The significant impact on the environment on economic development, often leading to a quick depletion of agricultural land and natural resources." (Briguglio 1999).

The Andaman and Nicobar Islands are susceptible to all the threats mentioned above. The tsunami that struck the islands on December 26, 2004 not only affected the human populations of the islands and their infrastructure, but also caused extensive damage to the natural ecosystems that were already stressed by anthropogenic pressures such as deforestation and destruction of mangroves, sand mining, unsustainable fishing practices, soil erosion, coral destruction, unplanned and unsustainable tourism, wildlife trade and the introduction of exotic species.

While there are limitations to the extent to which the negative impacts of the above processes can be arrested or tackled, appropriate development planning in these areas could surely help to counter or mitigate some of the negative impacts or at least make the communities dwelling here less vulnerable to these impacts. In the development context of the Andamans this is more so as only 5% of the land is fit for agriculture and not too much industrial activity can take place and therefore pressures on coasts is more and hence need to conserve coasts is even more imperative. However, over the last few years, unregulated development has degraded coastal stretches and depleted resources – this has happened in contravention of the CRZ Notification, which is one of the most important legislations for the coasts.

PART 2

IMPLEMENTATION OF LEGAL & POLICY FRAMEWORK FOR COASTAL CONSERVATION & REGULATION IN ANDAMANS

2.1. Coastal Regulation Zone (CRZ) Notification, 1991 – The Potential to Protect Coastal Habitats and Coastal Communities

In this section the primary focus is on the Coastal Regulation Zone Notification, 1991 and its implementation in the Andaman Islands. The focus of this study is limited to the Notification as it is a vital legal framework governing coastal areas. Although other environmental laws would apply to select areas, e.g., forest and wildlife laws on mangroves, the CRZ would primarily be applicable to allow or not allow activities. With respect to Andamans, the CRZ would be instrumental in deciding activities and developments because of its special status as an oceanic island group (recognized by CRZ as category IV; refer details below) and environmental issues confronting islands are more complex; it is critically important to address these.

In the context of the tsunami, the challenges posed to the CRZ are centered around the fact that the Island's tidal lines have undergone a shift because of changes brought about by earthquakes and serious reconsideration that is required due to inadequate implementation of the CRZ since its inception.

The CRZ Notification, issued in 1991 under the Environment (Protection) Act, 1986 and the Environment (Protection) Rules, 1986 is the most significant and specialised legislative guidelines regulating anthropogenic activities along the coast. Its importance lies with the fact that it empowers the Ministry of Environment and Forests (MoEF) with substantial power to take action "for the purpose of protecting and improving the quality of the environment and preventing, controlling and abating environmental pollution."

"Apart from the Coastal Regulation Zone Notification, 1991, there are many legislations, official orders and notifications, related to coastal activities. The following are important: Indian Fisheries Act, 1897(and the various state fisheries laws that followed); the Indian Ports Act, 1908; Merchant Shipping Act, 1958, Wildlife (Protection) Act, 1972; Water (Prevention and Control of Pollution) Act, 1974, Air (Prevention and Control of Pollution) Act, 1981; the Indian Coast Guard Act, 1974; and Maritime Zones of India (Regulation of Fishing by Foreign Vessels) Act, 1981 and Environment (Protection) Act, 1986; The Petroleum Act, 1934; National Environment Tribunal Act, 1995; Hazardous Wastes (Management and Handling) Rules, 1989, the Coast Guard Act, 1978, the Territorial Waters, Continental Shelf, Exclusive Economic Zone and Other Maritime Zones Act, 1976, the Offshore Mineral (Development and Regulation) Act, 2002.

In addition to this, India has signed and ratified several international conventions relating to oceans and related activities. Some of these are related to marine environment and applicable to coastal areas also. The important ones are the following: MARPOL 1973/1978; London Dumping Convention, 1972; Convention on Civil Liability for Oil Pollution Damages (CLC 1969) and its Protocol, 1976; Fund, 1971 and its Protocol, 1979; CITES, Convention on Biodiversity, 1992 includes coastal biodiversity also. Others such 'soft laws' include UN Convention on the Law of the Seas (UNCLOS), and guidelines under the International Maritime Organisation such as ballast water guidelines.

The CRZ notification seeks to operationalise three objectives, which are very significant:

Siting or location of activities or operations

This is based on the understanding that coasts perform important functions for coastal communities and ecosystems. The coasts are important nesting and feeding grounds for several terrestrial and aquatic species. These coastal habitats also provide sustenance and livelihood opportunities to several coastal communities (both fishing and non-fishing communities). Rules for the siting of activities can ensure that the rights of traditional fishing and coastal communities over certain areas are not compromised to meet increasing development requirements such as the demands of the burgeoning tourism industry.

Restricting and permitting activities

The CRZ Notification defines the nature of activities

that are to be regulated or restricted. It does not issue a blanket ban on all activities but lists activities that are restricted and those that are permitted.

Balancing development and protection needs

This objective is ingrained in the spirit of the CRZ, which recognises that different areas have different ecological sensitivities and therefore need varying levels or modes of protection.
Thus, the protection afforded to CRZ I is designed to be more stringent than that accorded to CRZ II areas, where more activities are permitted.

2.2. CRZ Notification, 1991– salient features

The CRZ notification declares the coastal stretches of seas, bays, estuaries, creeks, rivers and backwaters which are influenced by tidal action (in the landward side) up to 500 metres from the High Tide Line (HTL) and the land between the Low Tide Line (LTL) and the HTL as the Coastal Regulation Zone. It imposes restrictions on the setting up and expansion of industries, operations, processes, etc. in the said **Coastal Regulation Zone** (CRZ). For purposes of the Notification, the High Tide Line (HTL) is defined as the level up to which the highest point reached by the high tide during spring tides.
The Notification also stated that the coastal states and Union Territories should prepare within a period of one year from the date of the Notification, **Coastal Zone Management Plans** (CZMP) identifying and classifying the CRZ areas within their respective territories in accordance with the guidelines given in Annexure I and II of the Notification and that these plans are to be approved (with or without modifications) by the Central Government in the Ministry of Environment and Forests.
The CRZ notification follows a classification system for the CRZ based on their ecological and geomorphological characteristics and on the nature of anthropogenic presence in these areas.

1. **CRZ-I** (i) is to comprise areas that are ecologically sensitive such as national parks, sanctuaries, wildlife habitats, mangroves, coral reefs, areas close to breeding and spawning grounds of fish and other marine life, areas of outstanding natural beauty/heritage, areas likely to be inundated due to a rise in sea level resulting from global warming and such other areas as may be declared by the Central Government or the concerned authorities at the State/Union Territory level from time to time.
2. CRZ-I (ii) are those areas lying between the Low Tide Line and the High Tide Line.
3. CRZ-II areas are those already developed up to or close to the shoreline. This refers to areas within municipal limits or in other legally designated urban areas provided with drainage, approach roads, water supply, etc.
4. CRZ-III areas are those which are relatively undisturbed and do not belong to either CRZ I or II. These include the coastal zone in rural areas (developed and undeveloped) and those within municipal limits or in legally designated urban areas that are not substantially built up.
5. CRZ-IV are the coastal stretches in Andaman and Nicobar, Lakshadweep and small islands, except those designated as CRZ-I, CRZ-II or CRZ-III.

2.3. Classification of CRZ in the Andaman Islands

Most of the area in the Union Territory of the Andaman & Nicobar Islands has been classified to come within CRZ-IV. This classification of CRZ-IV is unique to islands of Andaman & Nicobar, Lakshadweep and others and it was specifically drafted taking into consideration the islands' unusual, rare and fragile coastal ecosystem because of their geophysical features. The Notification further states that in some of the islands the coastal stretches may be classified as belonging to CRZ I, II or III.
In reality, CRZ-I include areas of reserved forests, protected forests, mangroves, wildlife sanctuaries, national parks, ecologically sensitive areas, etc. The entire rural/revenue area is under CRZ-IV except a very small area, which is under CRZ-II. The coastal stretches of Port Blair, Bambooflat, Hut Bay, Mayabunder, Campbell Bay Headquarters and several other areas have been proposed to be declassified as CRZ II [1].

2.4. Implementing agencies

The responsibility of implementing the CRZ Notification rests with the State Governments and the MoEF. On 26 November 1998, the MoEF constituted 13 State Coastal Zone Management Authorities (SCZMAs), one for each of the coastal states and Union Territories and a National Coastal Zone Management Authority (NCZMA) to monitor and implement the provisions of the CRZ Notification.

[1] List of CRZ II areas in draft Coastal Zone Management Plan of the Andaman and Nicobar Islands.This classification is a matter of contention. The above information on classification was sourced from a document titled the 'Coastal Zone Management Plan for the Andaman and Nicobar Islands' which is a document approved with conditions specified by the MoE

The National and State CZMAs also have the powers to enforce clauses of the notification and address violations using the penal clauses in the Environment (Protection) Act, 1986.

The SCZMAs have a fairly extensive and important mandate, empowered to "take action and issue directions". They can identify ecologically sensitive and economically important areas, implement all provisions of the CRZ Notification including recommending projects for clearance to the central and state governments.

The Andaman and Nicobar Islands Coastal Zone Management Authority was constituted vide amendment. **S.O. No. 992(E) 26th November 1998. The latest notification with the extension of the term of the CZMA members in the ANI is dated 31st March 2005.**

In particular they can:

1. Enquire into cases of alleged violations and issue directions under Section 5 of the Environment (Protection) Act, 1986.
2. Review cases of violations and refer such cases to the NCZMA.
3. Take action to verify the facts related to the cases of violations.
4. File complaints under the Environmental Protection Act.
5. Deal with environmental issues referred to it.
6. It has a proactive responsibility of identifying ecologically sensitive areas along the coastal stretches and economically important areas and formulating specific management plans for these areas.
7. Such plans are to be authorised by the NCZMA.
8. Their most significant function however, is examining all project proposals for CRZ areas before the relevant agencies such as the Central Govt or the State Governments/Administrations of U.Ts approve these projects.

However, it is not clear if all projects that take place in the Andamans actually do reach the CZMA for their scrutiny or whether these functions have been further delegated to any other specific committee. It appears from our discussions with various government officials in the forest and revenue departments that in the Andaman and Nicobar Islands, the following authorities play an important supportive role in the monitoring and enforcement of the CRZ notification:

1. The officials of the concerned Municipal Councils for CRZ areas falling within municipalities.

2. The Deputy Commissioner of the district for CRZ areas falling within revenue lands.

3. Officers under the Department of Revenue.

4. Concerned Divisional Forest Officers and other officials of the Forest Department for CRZ areas falling within forest lands.

2.5. Dilutions to the provisions of the notification

Since 1991, there have been 20 amendments and 3 corrigenda (up to January 2005) to the provisions of the Notification. Each of these amendments dilutes and introduces newer clauses that complicate and render many of the protective clauses meaningless. Some of the amendments which are specifically relevant to the Andaman and Nicobar Islands are mentioned below:

A chronology of amendments & events[2] related to the CRZ notification in the context of Andaman & Nicobar Islands

Date of amendment/order/ event & legal clauses	Details / comments / features
31st December 1992	• Intense pressure from hotel & tourism lobby on Govt. of India that the restrictions under CRZ severely limited their scope of work. • As a consequence, the BB Vohra Committee set up by the Central Government to study the CRZ Notification and its implications and submitted its report with recommendations to GoI on December 31, 1992. • S.O 690(E) Corrigendum dated 19th September 1994 rectified that the BB Vohra Committee was set up to look into 'tourism, and hotel facilities in the said zone' (i.e. CRZ)
11th November 1993S.O. 859 (E)	• Based on pressure from the tourism lobby, amendments were proposed to CRZ Notification • A draft notification was issued inviting objections and suggestions from the public.

[2] EQUATIONS gratefully acknowledges Ms. Aarthi Sridhar (ATREE) for her efforts and contributing the table for this report.

Date of amendment/order/ event & legal clauses	Details / comments / features
18th August 1994 later changed to 16th August 1994 vide Corrigendum dated 19th September 1994 S.O. 595 (E)EPA, 3(2)(v), 3(1)EP Rules 5(3)(a), 5(3)(d)	• Amendment stated that HTL was to be demarcated by demarcating authority constituted by GoI in consultation with Surveyor General. • Importantly, the resultant amendment, in clarifying the meaning of HTL:- Significantly amended the mandatory CRZ of 100m for rivers, creeks, etc to 50m - Gave expansive powers to Central Government, which could now grant permission for construction on the landward side within 200m from HTL (i.e. No Development Zone {NDZ}) according to its discretion. • Did not allow for flattening of sand dunes while landscaping, but allowed live and barbed fencing and conditional construction of basements. Goal posts, net posts, lamp-posts were allowed. • Basements were permitted subject to receipt of No Objection Certificate • from State Ground Water Authority and provided it would not obstruct the free flow of ground water. • Permitted plot falling in NDZ areas to be included for FSI calculation, although no construction would be permitted in NDZ.
18th April 1996The Supreme Court's judgment in the Indian Council for Enviro Legal Action case:Writ Petition (Civil) 664 of 1993I.A 19 of 1995 by The Goa Foundation, India Heritage Society (Goa chapter), Nirmal Vishwa	The SC dealt with two main contentions of the petitioner; that of non-implementation of the notification and the validity of the 1994 amendment. • The SC quashed 3 of the proposed amendments of August 1994: 1. The relaxation of CRZ limits to 50m from 100m limit for rivers, creeks, etc. 2. Unbridled power granted to the Central Government 3. The area of NDZ to be taken into account while calculating FSI-FAR be 100 per cent. (FSI-FAR indexes, it was decreed, could take into account only 50 per cent of NDZ in its calculations.) Regarding the Notification implementation, the Supreme Court: 1. Pulled up enforcement authorities for dereliction of duties, while directing authorities to implement the Notification. The court further commented that a single authority may not be able to monitor the CRZ, and suggested the constitution of State and National Coastal Zone Management Authorities, which could also draw upon the resources of NGOs to help implement laws. 2. Ruled that CRZ for rivers be reinstated as a minimum of 100m in the absence of adequate justification to reduce it to 50m, and quashed the move to grant the Central Government arbitrary "unguided and uncanalised" powers to grant permissions for relaxation of NDZ limits. In addition, the court directed that CZMPs of all coastal states and union territories must be submitted by end June 1996, and set the date of hearing compliance of submission and finalisation regarding this for September 1996. 3. Directed that in matters dealing with local geographical areas, the High Court must see that the law is enforced and hear complaints made by local inhabitants. The Supreme Court would only scrutinise matters regarding approval of CZMPs, or any suggested modifications in existing classification of areas. 4. Issued show cause notices to the chief secretaries of states of Andhra Pradesh, Karnataka, Gujarat and Kerala for not having submitted their management plans as directed in interim orders issued earlier. 5. Finally, ruled that till the CZMPs are finalised, the interim orders mentioned above would continue to operate.

Date of amendment/order/ event & legal clauses	Details / comments / features
31st January 1997S.O.73(E)EPA 3(1), 3(2)(v),EP Rules5 (3)(a), 5(4)	• This amendment was result of requests from A&N Islands Administration to Central Government regarding difficulties faced by local people due to restrictions on withdrawal of ground water and prohibition of sand mining in CRZ. • No objections were invited for this amendment. • Manual drawal of ground water through ordinary wells or hand pumps was permitted for drinking purposes for local inhabitants only. · • Permission for the same was required from Secretary, Department of Environment. • Sand mining was allowed in A&N Islands as long as a special Committee gave permission based on certain conditions. • Mining was permitted upto 31st March 1998 and not beyond. (This means a prohibition exists on the extension of the deadline)
9th July 1997S. O. No. 494(E)EPA 3(1), 3(2)(v),EP Rules5 (3)(a), 5(4)	• No objections were invited for this amendment. • The Court has issued no orders to date. • The rationale was that State Governments had expressed need for several essential facilities to be constructed in the coastal zones. • Several provisions of the amendment continue to be operative.
20th April 1998 S.O 334 (E)EPA 3(1), 3(2)(v),EP Rules 5(3)(a), 5(4)	• This rationale for this amendment was stated again to be difficulties faced by local people of A&N Islands due to restrictions on sand mining. • No objections were invited for this amendment. • The amendment extended the permission for sand mining to the 30th September 1998, ignoring prohibition of extension of this deadline as stated in 31st January 1997 amendment.
30th September 1998S.O 873(E)EPA 3(1), 3(2)(v),EP Rules 5(3)(a), 5(4)	• Based on the same rationale of difficulties of local people of A&N Islands another amendment was issued. • No objections were invited for this amendment. • Permission for sand mining was extended upto 30th September 1999 • The permitted quantity of sand for mining was to be based on the "requirements of 1998-99 and 1999-2000 annual plans."· • This amendment also ignores prohibition of extension of this deadline as stated in 31st January 1997.
29th December 1998S.O 1122(E)EPA 3(1), 3(2)(v),EP Rules 5(3)(a), 5(4)	• No objections were invited for this amendment. • The Central Government is said to have deliberated upon and decided to simplify procedure for demarcation of HTL, which it laid down in this notification. • The HTL is defined as the line on land up to which the highest water line reaches during spring tide. • The amendment lays down that HTL shall be demarcated uniformly in all parts of the country by demarcating authority or authorities so authorised by Central Government, in accordance with general guidelines issued in this regard. • However these have not been spelt out in the Notification.
Draft amendment dated 5th August 1999S.O 692(E) EPA 3(1), 3(2)(v), 6	• Objections were invited to this amendment. • The notification states that inhabitants of the CRZ area have faced difficulties and there is a need for infrastructure facilities along the coast. • It sought once again to reduce CRZ for rivers, creeks and backwaters to 50m based on certain conditions. • It also stated that for permitted facilities for storage of petroleum products in Annexure - III, both MoEF and MoST were involved depending on location of project and port limits (port limits are those that have been notified as such before the 9th July 1997 amendment)

Date of amendment/order/ event & legal clauses	Details / comments / features
	• Facilities for receipt, storage and regasification of Liquefied Natural Gas were permitted according to guidelines issued by MoPNG and MoEF. • It permitted salt harvesting in CRZ-I areas between the LTL and HTL provided they were not classified as CRZ-I • It removed the authority for permitting construction along CRZ-III areas, which was introduced by the 9th July 1997 amendment. • Permission for construction required for 'local inhabitants' is to be granted by either the Centre or State or any designated authority (however it is not specified which of these is the final authority). The amendment lays down more conditions under which such construction maybe permitted. • Constructions in CRZ –III between 200-500m from HTL, were previously permitted for meeting traditional rights and customary uses. The words 'local inhabitants' have replaced the previous words 'traditional rights and customary uses'. The term local inhabitant used in this clause and elsewhere in the notification is defined as a person or his descendants who have been inhabiting in the area prior to the 19th February, 1991. • Relaxations were made for reconstruction / alteration of existing buildings allowing for horizontal landward extension of dwelling unit not exceeding a total plinth area of 100m. • It made 'exploration for extraction of oil and natural gas in CRZ a permissible activity requiring permission from the MoEF'.
29th September 1999S.O. 998 (E)EPA 3(1), 3(2)(v)EP Rules 5(4)	• No objections were invited for this amendment. • Using the rationale that local people of A&N Islands faced difficulties, another amendment was issued. • Permission for sand mining was extended upto 30th September 2000.
4th August 2000S.O 730 (E)EPA 3(1), 3(2)(v), 6	• The amendment is the final notification for 5th August 1999 draft amendment. • The amendment states that all objections and suggestions relating to oil and natural gas exploration; procedure for according clearance to storages of specified petroleum products and receipt, storage and regasification of LNG and points raised by the petitioner in Delhi High Court in civil writ petition No. 4198/98 have been duly considered by the Central Government. • This final amendment to earlier draft retained only two of proposed changes and withdrew the rest. • The changes were ones related to para 2(ii) about facilities for receipt, storage and regasification of LNG, which was permitted according to guidelines issued by the MoPNG and MoEF and 3(2)(ii) about exploration for oil and gas in the CRZ.
29th September 2000S.O 900(E)EPA 3(1), 3(2)(v)EP Rules 5(3), 5(4	• No objections were invited for this amendment either. • Using the rationale that the local people of the Union Territory of the Andaman and Nicobar Islands faced difficulties, another amendment was issued. • Permission for sand mining was extended upto 30th September 2001. • The dates for the annual plans were also extended by a year.
12th April 2001S.O 329(E)EPA 3(1), 3(2)(v),EP Rules 5(3)(a), 5(4)	• No objections were invited for this amendment. • Projects of Department of Atomic Energy were exempted from prohibition. • Facilities for receipt and storage of petroleum products and LNG as specified in Annexure III appended to the Notification and facilities for regasification of LNG were permitted provided certain guidelines were followed. • The delegation of powers to accord clearances to MoST were withdrawn.

Date of amendment/order/ event & legal clauses	Details / comments / features
	• Land reclamation etc was permitted for certain activities provided that reclamation for was not done for commercial purposes such as shopping and housing complexes, hotels and entertainment activities. • Mining of sands, rocks and other substrata materials was permitted for exploration and extraction of oil and natural gas. • Construction activities related to projects of Department of Atomic Energy were treated as permissible activities requiring permission from the MoEF. • Operational constructions for ports, harbours and light houses and constructions for activities such as jetties, wharves, quays and slipways, pipelines, conveying systems including transmission lines were also added to permissible activities needing MoEF clearances. • Projects relating to Department of Atomic Energy and (b) Pipelines, conveying systems including transmission lines were permitted in CRZ-I (i) areas • In the CRZ-I area, exploration and extraction of natural gas was permitted. • The West Bengal CZMA was made responsible for according permission for construction of dispensaries, schools, public rain shelters, community toilets, bridges, roads, jetties, water supply, drainage, sewerage which are required for traditional inhabitants of the Sunderbans Biosphere Reserve. • The amendment permitted storage of petroleum products specified in the Annexure in any part of CRZ other than CRZ-I areas. Previously this was restricted only to port areas. • LNG was added to list of petroleum products on Annexure III. • Environmental clearances accorded by MoST from 9th July 1997 till publication of this Notification.
3rd October 2001S.O 998(E)EPA 3(1), 3(2)(v),EP Rules 5(3)& (4)	No objections were invited for this amendment. • The ratio nale was that local people of A&N Islands faced difficulties, yet another amendment was issued. • Permission for sand mining was extended upto 30th September 2002. • The dates for annual plans were also extended by a year.
11th January 2002Draft amendment S.O 51(E)EPA 3(1), 3(2)(v), 6EP Rules 5(3)(a)	The rationale for this amendment is stated to be: - The inhabitants of areas falling within CRZ are facing difficulties and there is a need for infrastructural facilities in these areas. - The Central Government is stated to have had consultations with state governments and taken a decision to permit construction of dwelling units and development of infrastructural facilities for local inhabitants; housing schemes of Urban Development Authorities which had been approved prior to 19th February 1991, facilities and activities including setting up of non polluting industries in the field of information technology and other service industries in the Special Economic Zones, and salt harvesting by solar evaporation of sea water in the said zone. • It introduced a 90-day time limit for assessment of projects and 30 days for conveying a decision on the clearance status of projects proposed within the CRZ. • It introduced the same provisions (with slight modifications) for the Note of Para 1 (i) of the notification that the 5th August 1999 draft amendment introduced. This was despite these proposed provisions of 5th August 1999 draft amendment being excluded in the subsequent amendments dated 4th August 2000 and 12th April 2001, and 3rd October 2001. • The draft amendment exempted "non polluting industries in the field of information technology and other service industries in the CRZ of Special Economic Zones" from prohibitions as Para 2 (i) (c).

Date of amendment/order/ event & legal clauses	Details / comments / features
	• It sought to exclude mining of certain minerals under Atomic Energy Act, 1962 from the prohibited activities clause, subject to EIA studies and an approved mining plan. • Housing schemes in CRZ area, mining of rare minerals and specified activities/facilities in SEZ were to be permissible activities requiring clearances from MoEF. • Salt harvesting by solar evaporation of sea water was to be permitted in CRZ-I areas. • In CRZ-II areas, exemption was made for housing schemes of State Urban Development Authorities. • Further relaxations were sought for CRZ-III areas, based on similar changes proposed in 5th August 1999 draft amendment. All activities within SEZs were permitted. • This amendment substitutes the words 'local inhabitants' for traditional rights or customary uses. • The notification replicates all other provisions of the 5th August 1999 draft amendment as far as relaxations for constructions for 'local inhabitants' etc are concerned despite most of these being omitted in subsequent final amendments.
21st May 2002S.O 550(E)EPA 3(1), 3(2)(v),EP Rules 5(3)	• The amendment is the final notification for the draft 11th Jan 2002 amendment. • It redefined distance upto which CRZ is measured along the rivers, creeks etc, as upto the point where a minimum salinity level of 5 ppt is recorded. • All the provisions that were common to the 5th August 1999 draft and the 11th January 2002 draft were struck down by this final amendment. • It permitted "non-polluting industries in the field of information technology and other service industries in CRZ of Special Economic Zones (SEZ)". • It retained the time limit on assessment of project documents that was proposed in the 11th January 2002 draft. • Certain changes were made to activities permitted in CRZ I, II & III zones.
19th October 2002S.O 1100 (E)EPA 3(1), 3(2)(v),EP Rules 5(3)& (4)	• No objections were invited for this amendment. It was issued in 'public interest' using Rule 5(4) of the EP Rules· Rationale was 'to harmonise & elaborate provisions of the Notification' and to provide permission for setting up of certain projects that were presumably in public interest. • The following were permitted within the CRZ in areas (including CRZ II and III) not classified as CRZ-I: - Facilities for generating power by non-conventional energy sources and setting up of desalination plants and construction of airstrips in Islands of Lakshadweep and A&N with MoEF permission. • It stated that clearances given for activities in CRZ area were valid for 5 years before which construction or operations should commence. • However further actions have not been elaborated on, for instance, on adherence to clearance conditions. • The following activities required MoEF clearances to be set up in CRZ areas: - Facilities for generating power by non conventional energy sources, desalination plants, weather radars, airstrips and associated facilities in Lakshadweep and A&N Islands. - In CRZ-I areas installation of weather radar for monitoring of cyclone

Date of amendment/order/ event & legal clauses	Details / comments / features
	movement and prediction by Indian Meteorological Department was permitted. - In the CRZ-I between HTL and LTL, the following was permitted: desalination plants, storage of non-hazardous cargo such as edible oil, fertilizers and food grain within notified ports. - In CRZ II and III areas list of products in Annexure III was permitted subject to conditions mentioned in Para 2(ii).
16th January 2003S.O 52 (E) EPA 3(1), 3(2)(v)EP Rules 5(3), 5(4)	• No objections were invited for this amendment since it was stated to be in public interest. • Rationale was that A&N Administration had stated that local population was facing difficulties due to restrictions on sand mining. • It extended sand mining in A&N Islands upto 31st March 2003. • This was to be permitted by a Committee from 1st April 2002 to 31st March 2003. • There was total upper limit fixed on amount of sand that could be mined at 55,127 cu.m and this was only to be permitted for construction purposes on a case by case basis. • The sand was to be mined from selected sites inter alia based on rate of replenishment of deposition of sand. • Permission could be granted based on mining plans, with stipulations on safeguards to prevent damage to the sensitive coastal eco-system including corals, turtles, crocodiles, birds nesting sites and protected areas.
22nd April 2003S.O 460(E)EPA 3(2)(1), 3(2)(v)EP Rules 5(3), 5(4)	• This amendment was issued using the public interest clause without inviting objections to the same. • For the first time in history of CRZ, this clause [EP Rules 5(4)] had been used to actually prevent further ecological damage, unlike earlier instances where the clause was used to relax provisions of the Notification and allowing more and more activities on coasts. • Rationale given by Central Government was that it had been informed that large sized projects were being implemented without clearance from MoEF and that this resulted in destruction of mangroves, depletion of ground water and certain other activities involving ecological damage. • It sought to add a few more activities to list of permissible activities requiring environmental clearance from MoEF. There were: - The demolition or reconstruction of buildings of archaeological or historical importance, heritage buildings and buildings under public use (defined in the amendment as including 'use for purposes of • worship, education, medical care and cultural activities. All other activities involving an investment of less than five crore rupees were to be regulated by the State level authorities in keeping with provisions of the Notification in Annexure I; any project costing • more than five crores required clearance from MoEF.
30th May 2003S.O.635 (E)EPA 3(1), 3(2)(v)	• No objections were invited for this amendment either. Rationale was that local people A&N Islands were faced with • difficulties. • Permission for sand mining was extended upto 31st March 2004. • The dates for the annual plans were also extended by a year. The quantity of sand to be mined was fixed at 44,102 cu.m only for construction purposes

Date of amendment/order/ event & legal clauses	Details / comments / features
30th May 2003 S.O.636(E)EPA 3(1), 3(2)(v)EP Rules 5(3), 5(4)	• No objections were invited for this amendment as this was in public interest. • The amendment was introduced presumably taking into consideration requirement of construction of jetty and wharves for embarkation and disembarkation in Lakshadweep. • The amendment revised the Committee to permit sand mining in. • Permission for sand mining was extended upto 30th September 2001. • The dates for the annual plans were also extended by a year.
24th June 2003S.O.725(E)EPA 3(1), 3(2)(v)EP Rules 5(3), 5(4)	• The notification introduced another clause under norms for development for CRZ IV for setting up of facilities for treatment of wastes and effluents arising from hotels, beach resorts & domestic sewage and disposal of treated wastes and effluents in areas other than CRZ-I. • This was to be based on a detailed scientific study to assess environmental impact of the same.
24th July 2003 S.O.838 (E)EPA 3(2)(1), 3(2)(v)EP Rules 5(3), 5(4)	• This amendment was issued using the public interest clause without inviting objections to the same. • The amendments were introduced by Central Government after it had considered specific requirements of projects relating to Department of Atomic Energy in terms of their location. • Another reason stated was that Central Government had considered proposals of the Ministry of Tourism and Culture, the A&N Administration and the Lakshadweep Administration for promotion of tourism development. • It reduced the NDZ area in CRZ-III to 50m in A&N Islands and Lakshadweep. • This reduction was for the purpose of promotion of tourism, based on an integrated coastal zone management study conducted by MoEF by itself or through any agency authorized by it in this behalf. • It also introduced other building relaxations for the islands.
25th Jan. 2005SO.Nil (E)	• The amendment states that in A&N Islands, mining of sand may be permitted for construction purpose on a case to case basis by a Committee constituted by the Lieutenant Governor of the Andaman and Nicobar Islands consisting of – (1) the Chief Secretary, Andaman & Nicobar Administration; (2) Secretary, Department of Environment; (3) Secretary, Department of Water Resources; and (4) Secretary, Andaman Public Works Department; • That total quantity of sand to be mined shall not exceed 28,226 cu m for period ending on 31st December, 2005 and that sand mining shall be undertaken only in those areas identified as accreting areas by Institute for Ocean Management (IOM), Chennai and based on rate of replenishment or deposition of sand; • That permission as may be granted under this sub-paragraph for mining of sand shall be based on mining plans and shall stipulate sufficient safeguards to prevent damage to the sensitive coastal eco-system including corals, turtles, crocodiles, birds nesting sites and protected areas· • A&N Administration to identify alternate construction materials within period of one year i.e., from 1st January, 2005 to 31st December, • 2005; A monitoring Committee shall be constituted for monitoring the mining • activity and environmental safeguards taken, by A&N Administration. The monitoring Committee shall comprise of representatives from Union Territory Administration, Regional Office of the Ministry of Environment and Forests, Bhubaneshwar and a NGO based at Andaman • and Nicobar. The monitoring report shall be sent quarterly to Ministry of Environment and Forests.

2.6. Analysis of amendments made to the CRZ Notification

2.6.1. Reduction in the No-Development Zone for promotion of tourism

- The first amendment to the Notification was made because of pressure from the tourism lobby.

- The amendment was vide notification no. S.O. 595(E) dated 18th Aug 1994 on recommendations of the Vohra Committee, which was constituted on 1st Jan 1992 and report submitted on 31st Dec 1992. The issue dealt with was tourism. The reason for the constitution of the committee was that there was intense pressure from the hotel and tourism lobby on the GOI stating that the said notification was very stringent and their work was severely restricted by the CRZ.
- One of the recommendations of the Committee was reduction of distance of the NDZ in selected coastal stretches for promoting tourism. The Ministry amended the CRZ Notification, 1991 on 18th Aug 1994, reducing No Development Zone (NDZ) area all along the coast from 200m to 50m. The amendment also permitted construction in NDZ thus giving expansive powers to the central government to permit such constructions on the landward side within 200m from the HTL according to its discretion.
- The Vohra Committee report also noted that the HTL demarcation was not clearly defined. Based on the recommendations, the Ministry defined the HTL and demarcation agencies in the amendment dated 8th August 1994. Hence it was stated that the demarcating authority would demarcate the HTL. This authority was to be constituted by the Govt. of India in consultation with the surveyor-general.
- The Report recommended landscaping in the NDZ by dressing of sand dunes, live fencing along the resorts and permitted playfields but not swimming pools in the NDZ. The amendment though did not allow for the flattening of the sand dunes while landscaping but permitted net posts, lampposts, goal posts and live and barbed fencing and conditional construction of basements. For the construction of basement, NOC was to be obtained from the Ground Water Board and provided it did not obstruct the natural flow of ground water.
- It also permitted for the area under NDZ to be covered under the FSI calculation even though no construction would be permitted.
- Although the SC quashed the amendments later, the tendency of MoEF to dilute its own laws raises concerns about where its loyalties lie – a facilitator of impact inducing developments rather than that of a regulator.
- The tourism chapter of the State Development Report of the Andaman and Nicobar Islands (draft) voices the same attitude: "While most of the acts in force are designed to protect the ecology and environment, the CRZ guidelines are generally perceived to be inhibiting. In case of CRZ I, no new construction is permitted up to 500 meters from the high tide line (HTL) while this is reduced to 200 meters in case of CRZ III. CRZ II and IV also restrict development up to 200 meters from the HTL. However, it is reported that internationally CRZ norms of 50 and 70 meters are commonly used and combined with stringent limits on land area covered, number of buildings, etc. There is thus a suggestion to look at the CRZ regulations on a case-to-case basis" (NIPFP 2005 c). It is important to note that the first amendment that the first amendment to the CRZ came because of tourism.
- The NDZ reduction was eventually reduced to 50m in the case of A&N Islands and Lakshadweep for tourism development through amendment of amendment, S.O.838 (E), 24th July 2003 against the directives of SC in 2002, which were based on Shekhar Singh Committee report. The relaxation was based on identification of areas in NDZ by the Integrated Coastal Zone Management Plan study conducted by the Ministry of Environment and Forests.
- First, the CZMPs of states are not prepared, including that for Andaman & Nicobar Islands; then an ICZMP is commissioned specifically for the purpose of relaxing CRZ norms for tourism development. To date, both the CZMP and ICZMP have not been finalized or approved. But the objective of reducing the NDZ to 50m has been successfully achieved for tourism development purposes! Tourism has succeeded in achieving its objective of reducing the NDZ from 200m to 50m in the A&N Islands. This has been possible by with active connivance of the MoEF. What the MoEF could not get through in Aug 1984, it achieved in July 2003. The was done in the guise of the ICZMP. The Department of Environment & Forests, A&N Islands Administration has included 40 islands to be opened up for 'ecotourism' in the Andamans. For the vulnerable and ecologically sensitive islands, this could as well mean doom.

2.6.2. Categorisation of CRZ II areas

The question regarding the classification of the islands demands a detailing of events in the past. Of particular relevance are the observations made by the Divisional Bench of the Calcutta High Court in an order dated 29.09.2003.

- Section 6(2) of the CRZ notification provides norms and regulations for the Andaman and Nicobar Islands, which it classed as CRZ IV. However, it does have a provision in point (vi) for the classification of the certain areas as CRZ I, II and III with approval from the MoEF.

- No documents were available to prove that reclassification of CRZ IV areas of parts of the ANI (such as Port Blair) into CRZ II areas were made with approval from the MoEF. Despite this, Byelaw No. 15 of the Port Blair Municipal Council Building Byelaws, 1999 classifies coastal areas of Port Blair as CRZ II areas.

- In their letter dated 27th September 1996, the MoEF accorded only conditional clearance to the CZMP for the Islands submitted to the MoEF by the ANI Administration.

- No documents were produced before the court to show that the conditions laid out by the MoEF were actually met. This would mean that the present document is not a fully approved document as no revisions were made to it based on any of the stipulations contained in the ministry's letter.

- One of the conditions laid out in the letter was that, for CRZ IV areas to be classified as CRZ II areas, a Committee had to be formed which would decide on this matter.

- No document was provided to the court to prove that such a Committee was ever formed before the CRZ IV areas of Port Blair in particular, were reclassified as CRZ II.

- The court therefore concluded that decision of the Administration and the Municipal Council to reclassify CRZ IV areas into CRZ II areas in areas such as Port Blair was "wholly unauthorised and ultra vires the CRZ notification".

Therefore it can be concluded that the reclassification of CRZ areas from CRZ IV to CRZ II is still not approved by the MoEF. Another inference which presents itself as a most serious matter is that from the inception of this important coastal legislation, till date, the ANI does not have a CZMP which is implementable because it is not fully approved by the MoEF.

2.6.3. No firm check on sand mining

As per Amendment no **S.O.73(E) dated 31st January 1997** mining was permitted upto 31st March 1998 and **not beyond. This means a prohibition exists on the extension of the deadline.** After this there have been 10 extensions made to allow sand mining in A&N Islands to date. The SC ordered in May 2002 that extraction of sand shall be phased out at a minimum 20% per year on reducing balance basis to bring the sand mining to the level of 33% of the present level of mining within a maximum period of 5 years. The sand mining is to be brought down to 24,633 cubic metres by May 2007 as per the order.

As per the amendment **S.O. 635 (E),** 30th May 2003 of the CRZ notification, Sand mining was permitted up to 44,102 cubic metres for construction purposes on a case by case basis for the period on and from the 1st day of April, 2003 to the 31st day of March, 2004 from sites selected, inter alia, based on the rate of replenishment or deposition of sand, by a committee. The CRZ Notification says that the Committee was to be constituted by the Lieutenant Governor of the Andaman and Nicobar Islands consisting of: (1) the Chief Secretary, Andaman and Nicobar Administration; (2) Secretary, Department of Environment; (3) Secretary, Department of Water Resources; and (4) Secretary, Andaman Public Works Department.

This amendment took place after the submission of the Shekhar Singh committee report to the Supreme Court which stated "The extraction of sand should be phased out and no further extension should be granted after the current extension is over on 30 September, 2002".

As per guidelines given in the CZMP of A&N Islands, minimum quantity of sand will be collected from identified eco safe pockets on a rotational basis; sands collected from coastal areas will be used after keeping the same in the open place for at least one full rainy season so that salt if any may be leached out; sand will not be collected from areas near mangrove patches, sand would generally not be collected during the monsoon to minimise disturbance to the coastal zone and landscape; coral sand will not be collected; stone dust from stone crushers and quarries will be utilised to reduce the use of sea sand; use of clay

[3] Personal communication with ACF, DFO Mayabandar.

bricks will be encouraged, this would reduce the use of hollow blocks which need considerable quantity of sand; sand will not be collected from sanctuaries, national parks or other ecologically sensitive areas close to the breeding and spawning grounds of fish and other marine life.

The Sand Allotment Committee regulates and gives permission for sand mining from identified sites that are incorporated into the forest working plans[3] . It is not clear whether there are additional parameters than those stated above for the identification of sites. The sites that are appropriate for sand mining were identified by the National Institute of Oceanography.

The permissible quantities are based on extraction capacity studies or after detailed assessment of the impacts of the activity. They also appear to be based on assessment of the actual need of the resource after having considered all the material options available for the construction sector, which may be less harmful to the ecology of the islands.

Areas of concern

Although the SC in its order has taken cognisance of the fact that unrestricted and continued sand mining is harmful to the ecology of the islands, ensuring that sand mining takes place only up to permissible quantities is a difficult job. Unless areas are clearly marked out for sand extraction and there is adequate public awareness that the extraction of sand from other areas is a legal violation that will result in penalties, it will be impossible for the administration to implement this.

The methodology for sand extraction has not been specified beyond what currently exists. There is no information on the parameters, or permissible limits, or monitoring and assessing the final impacts of such an activity. If sand mining is to take place in the islands, considering its sensitivity, it does require further planning for proper implementation and enforcement of restrictions. Currently there is little enforcement and this has resulted in a severe impact on the ecology of these islands. The management of the islands must factor in an exercise for regulating the sand mining currently taking place and plan for a phasing this out in a determined fashion.

2.7. Issues Relating to the Lack of Implementation of the CRZ Notification and the Coastal Zone Management Plan (CZMP)

The need for an integrated approach to the sustainable management of coastal anthropogenic activities and the protection of coastal ecosystems is imperative. The vision of the CRZ notification needs to be adequately built into the CZMP and all the other relevant plans mandated by the notification and should be drafted by various departments and institutions. Various 'vision documents' for the development of the islands need to incorporate coastal protection measures while addressing the needs of coastal communities. Issues such as solid waste management, water resource augmentation, land use regulations and building regulations must be addressed in order to sustain island ecosystems.
Currently, plans and vision documents of the various departments of the Andaman and Nicobar Islands Administration are replete with general statements such as "Natural resources of Andaman are under exploited", "Over exploitation and competition for resource utilisation in certain regions of the islands are also considered for planning". These have dangerous implications and might lead to a situation where the Andaman Administration becomes an agent that facilitates the dispersal of negative anthropogenic and development pressures to all/ most islands in order to maximise 'exploitation' of natural resources.

2.7.1. Present status of CZMP and the initiation of ICZMP

There is no fully approved CZMP for the ANI since the initiation of the CRZ Notification in 1991. All that is available for implementation agencies is a draft CZMP that has been conditionally approved by the MoEF. This conditional approval could mean that the ANI Administration was to revise their maps and plans along the conditions specified in the MoEF's letter dated 27, September 1996, and submit the final revised documents to the MoEF. It is not clear whether this has taken place, since there is no letter from the MoEF to this effect.
The MOEF also initiated a parallel process of drafting an **Integrated Coastal Zone Management Plan** (MoEF 2004). This was initiated for the Andaman and Nicobar and Lakshadweep islands through scientific institutions such as the Institute of Ocean

[4] Integrated Coastal Zone Management Plan Preparation for Andaman and Nicobar islands. A study commissioned by the Ministry of Environment and Forests, GOI. Period of the study: 2002-2004. Cost involved: Rs. 83.00 lakhs. The objective of the project is to promote the sustainable development of natural and physical resources and the maintenance of coastal ecological processes and genetic diversity in the coastal resources of Andaman and Nicobar islands through Integrated Coastal Zone Management plans.

management, Anna University, Chennai[4] and Centre of Earth Science Studies, Thiruvananthapuram respectively. Under this project, twenty inhabited islands of the Andaman group have been selected for developing ICZM Plans based on the status of the environment, socio-economic conditions and development potentials. The ICZMP is yet to be completed, finalised and discussed with various civil society groups that are involved in ecological, social and anthropological research and advocacy. However, without completing these processes, the MOEF amended the CRZ notification to state that based on the findings of the ICZMP, in identified areas of 13 islands which are part of the ICZMP process, the NDZ can be reduced from 200 m to 50 m for tourism development[5] .

The ICZMP report has not been finalised[6]. The study considered the constraints to development in the coastal areas of inhabited islands. As per plans, Cinque, Havelock, Neil, Rutland, North Passage, Long Island, Ross and Smith Islands have been recommended for development through tourism in the ICZMP.

It is still unclear whether the revised CZMP has been submitted to the MOEF and whether this has been approved. Therefore for all practical purposes, the CZMP and its current zonation are still not approved until so stated by the MoEF. An additional area of concern is that unless a cut off date is imposed, more and more areas will come under CRZ II as the ratio of built up to buildable area is constantly rising.

2.7.2. Linkages / conflicts between the CRZ and local development regulations

As stated earlier, the final categorisation of areas such as Port Blair still remain issues of contention and need to be clarified with the MoEF. The Land Reforms and Regulations Act, 1968 and the Andaman & Nicobar Islands (Panchayats) Regulation, 1994 control developmental activities in the Revenue lands of the island. In the case of Port Blair, the Port Blair Municipal Council Building Byelaws, 1999 and the appropriate development plan are applicable. However, no exercise appears to have been conducted whereby coastal zone maps are overlaid on village revenue maps to assist the concerned revenue officer in making appropriate comments from the angle of the CRZ. As stated earlier, while it appears that there are several other officers who might play an important role in the implementation of the notification, it is not clear if they have special orders with specific checklists or protocols to work under. Under the present circumstances, the implementation of the notification becomes exceedingly difficult for local authorities.

Box 1 Reconstruction Guidelines

As per the findings of the field surveys conducted by the APWD and the Revenue Department placed before the 3rd meeting of a committee (constituted vide the Andaman and Nicobar Administration's Order No. .Sect./12-09/89/Forests/PF/127 dated 31 December 97), only 36% of the buildable area of Hope Town was built and therefore it did not fall within the category of CRZ II. As per clarification contained in the MoEF's letter no. J-17011/13/92-IA-III dated 27 Sept. 96 vide, the revised Coastal Zone Management Plan of ANI was approved subject to certain conditions. One condition [(B (i)] states that in the determination of CRZ II areas, an area can be considered substantially built up only when the ratio of built-up and buildable area to that of total plots is 50% or more. However, at this meeting it was decided that a resurvey would be conducted by the District Commissioner (Andaman district). At its subsequent meeting held on 5 November 98, the committee reconsidered the details submitted by DC(A) and it was found that the total built-up area of Hope Town under CRZ is 39 ha as against the area of total number of plots under CRZ which is 65 ha. The committee therefore decided that Hope Town area shall be placed under the CRZ II category as the built up and buildable area is more than 50% of the plots and also it meets other requisite conditions of the notification under which coastal stretches can be categorised as CRZ II. In the second meeting of this committee under the chairmanship of the Chief Secretary, to identify areas to be categorised as CRZ II, the Chairman advised the DC, Andamans to prepare a map with relevant information for such revenue areas as they are existing within the limits of CRZ II for taking up further action. He also desired that the Chief Engineer, Andaman PWD should direct staff to assist the Revenue Department in preparation of these maps. It was directed that up-to-date maps showing settlements, various types of structures, etc. which have come up within the 200 meters area from HTL, except in the five areas identified as CRZ II , should be prepared at the earliest. It is not known if these maps were prepared.

2.7.3. CRZ violations: Construction and activities within the No Development Zone

The CRZ Notification clearly mentions the area that it seeks to protect and the activities from which it seeks to protect these areas. However, the notification leaves several issues which are

[5]S.O 838 (E) dated 24th July 2003, vide Gazette of India (Extra) No. 654.

[6]Pers. Comm. Samir Mehta, Dec 2005.

important for implementation and monitoring, very vague. Section 3 (2) states that a list of activities will require environmental clearance from the Ministry of Environment and Forests, Government of India, but nowhere in the notification is the process of granting clearances laid down.

It also states that for "Construction activities related to projects of the Department of Atomic Energy or Defence requirements for which foreshore facilities are essential such as slipways, jetties, wharves, quays; except for classified operational component of defence projects for which a separate procedure shall be followed." What the 'separate' procedure entails is not known. Impact Assessments must be made mandatory for these activities.

As a result, it is likely that most proponents who propose to develop projects in the CRZ are not aware of the conditionalities, and this lack of awareness may result in violation of the CRZ. Secondly, the lack of clarity of clearance procedures also makes it impossible for citizens and civil society groups to participate in the decision making or monitoring of the process or clearance and post clearance functioning of the project.

Since the CRZ notification is clear about which projects/activities are allowed in specific areas, it is possible to visually identify projects that may be in violation of the CRZ. However these need to be verified based on the exact location of the HTL and the date of establishment of the project or activity.

2.8 Facilitating Effective Coastal Management

From preliminary investigations, it is evident that several clauses of the CRZ and other regulations related to conservation and regulation of coastal areas are not being implemented. But detailed studies need to be undertaken to identify the specific gaps and loopholes in the implementation of these regulations and the reasons for existing violations. Given below are some of the key areas that need to be undertaken for investigation.

Siting of projects in the CRZ area

Since the CRZ Notification is based on spatial regulations, it is possible to visually identify which projects or activities are located in the prohibited area. However if their date of establishment precedes the notification, they are not in violation of the notification.

Sand mining regulations

Sand mining is permitted by the Allotment Committee in certain areas and up to certain quantities. The new forest working plans are to have this information too. An investigation needs to be conducted to identify to what extent the sand mining regulations are actually effective. Though the statistics indicate that sand mining has reduced by half following the SC orders, this needs to be ascertained through independent investigations. It is also quite likely that the statistics does not reflect the illegal sand mining that may be taking place without the knowledge of the Forest Department or other official agencies. Whether such sand mining is taking place and if yes, to what extent could also be ascertained through investigations.

Compliance of CRZ clearance conditions by projects

The CRZ notification gives the MoEF the powers to grant clearances to certain projects or activities on the coast. Under the EIA notification of the MoEF, such clearances are granted after review of all the information regarding the proposed project and certain conditions for the protection of the environment are imposed on the project while granting clearance. It is not known if a similar system is followed for projects granted clearance under CRZ notification. If indeed a similar system is followed, then it will be useful to undertake investigations to identify the extent to which projects are complying with the clearance conditions and thereby ensuring that environment impacts due to their projects are minimal.

The implementation of building regulations

Investigations need to be undertaken to ascertain the extent of implementation of the regulations for location, design and construction of buildings as per the laid down norms in the Islands.

The implementation of the Supreme Court orders

The Court Orders of 2002 covering the issues of logging, saw mills and other wood based industries, encroachments on forest lands, sand mining and diversion of forest land for development activities were passed by the Supreme Court in May 2002. Investigations should be undertaken to find out the level of compliance of these orders. Several of the time lines set by the Court while passing these orders have not been met by the administration. If civil society groups do not keep track of the compliance of these orders and pressure the administration to implement the orders within the stated time lines, more damage to the ecosystems will take place. Given all this, the tsunami has just reaffirmed that degradation of natural environmental barriers due to unfettered development and poor implementation of the CRZ Notification has exacerbated its impacts – thereby increasing damage to life and property.

PART 3

OVERVIEW OF IMPACTS OF EARTHQUAKE & TSUNAMI

On 26 December 2004, an earthquake measuring 9.0 on the Richter scale struck the west coast of Northern Sumatra. This was followed by aftershocks ranging from 6.3 to 7.0 (UNEP, 2005 [1]). The earthquakes triggered off a tsunami which battered the Indian coastline, proving to be one of the greatest disasters in the country's living memory, killing many people and causing extensive damage. In the Islands, more than 3,500 people lost their lives and about 10,000 houses were completely damaged (Table 2 summarises the types and extent of damage). Besides the extensive loss of lives, immense damage to the coastal ecology, settlements, ports, roads and bridges, water supply, agricultural land and fisheries has occurred. The maximum damage occurred in the Nicobar Group of islands in the south that were very close to the epicentre of the quake. Impacts on the economy of the islands from trade, agriculture, fisheries, small-scale industries and tourism in the short and long term are not fully calculable at this stage. However, there are some estimates of the damage caused by the earthquake and the tsunami.

After the earthquake and the tsunami, large scale seawater inundation of the coastal areas has taken place in parts of the Islands. Flooding of the low lying areas has been widespread. Some parts of the land have been uplifted in the northern group of islands creating new land and subsidence has happened in the southern parts of the Andaman Islands and in the Nicobars. This has also altered the High Tide Line. The High tide level has risen in many areas of subsidence causing flooding. The Low Tide Line has also risen, as a result of which seawater is not receding to the earlier levels.

TABLE 2 Summary of damages due to the Tsunami in Andaman & Nicobar Islands

DAMAGE	DAMAGE ACTUALS
Loss of lives	3513
Paddy land affected	1730 ha
Plantation Land affected	9107 ha
Boats fully damaged	938
Boats partially damaged	765
Loss of livestock	157577
Houses fully damaged (Approx)	10000
Jetties damaged	24

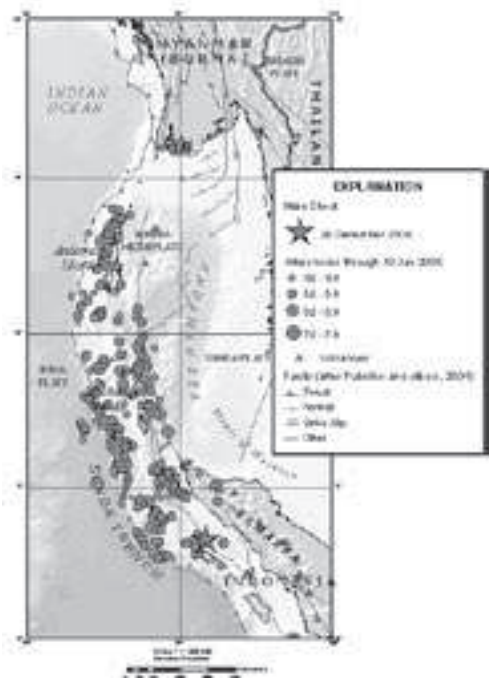
Source: Andaman and Nicobar Islands through Tsunami – A Saga of Courage. Relief Commissioner, Andaman and Nicobar Administration, August 2005

3.1 IMPACTS ON THE ANDAMAN ISLANDS

3.1.1 GEOMORPHOLOGICAL CHANGES

The earthquake was caused as a result of the collision of the Indian tectonic plate with the Burma plate and the subsequent sliding of the Indian plate underneath the Burma plate. The archipelago of the Andaman and Nicobar Islands has developed a crack between the Northern and Southern Andaman Islands with a tilt in the northwest–southeast direction. According to a study, the outermost Nicobar Islands have sunk by about 1.6 m, the northernmost Andaman Islands have risen by about 1.2 meters and between 5 m and over 200 m of the shoreline have been lost to the sea (in the Nicobars) (Sankaran et al. 2005). The northern most inhabited island of Diglipur has risen between 0.5 – 0.8 m while southern Andaman has sunk by 1.0 to 2.0 m. The geological and geomorphologic changes in the islands are continuing as the seismic oscillations and tectonic plate tremors are still occurring and will last till equilibrium is achieved (NIPFP 2005 c).

FIGURE 2: SUMATRA – ANDAMAN ISLANDS EARTHQUAKE OF 26 DECEMBER (FROM MCCLOSKEY ET AL 2005).



[1] United Nations Environment Programme / Office for the Coordination of Humanitarian Affairs, 2005. "Indian Ocean Tsunami Disaster of December 2004 - UNDAC Rapid Environmental Assessment in the Democratic Socialist Republic of Sri Lanka", Switzerland.

The internationally reputed peer-reviewed scientific journal "Nature" in its March 17 Issue 2005, (McCloskey et al, 2005) published a paper revealing that after the Dec 26 2004 quake, the Indian Ocean region is more prone to quakes and tsunamis than before. Another peer reviewed paper dated February 10 , 2005 in the same journal (Seabed reveals earthquake scars) it has been highlighted that the seabed has undergone considerable changes as a result of the Dec. 26, 2004 earthquake.

Box 2
Field Observations at South and North Andaman

In South Andaman, it was observed that large tracts of land (mainly agricultural) were inundated by seawater. This can be attributed largely to the sinking of the landmass due to the earthquake, which preceded the tsunami. Submerged houses were also observed.

In North Andaman, observations at the Jetty as well as near some of the smaller creeks and inlets revealed the lowering of the High Tide Line as a result of the upliftment of land in the northern parts of the islands.

3.1.2 Impacts on the Coastal Regulation Zone

The upliftment of land in the northern group of islands and subsidence in the southern parts has created new terrestrial land mass is the northern parts while terrestrial land has been lost in the southern parts of the Andaman Islands. This has caused a change in the High Tide Line and consequently in the Coastal Regulation Zone.

3.1.3 Impacts on coral reefs

The entire reef flats, starting from the north of Constance Bay on the western side of South Andaman Island, further north along the Middle and North Andaman Islands and along the eastern coast from the north up to Shoal Bay area in South Andaman Island, are exposed by about 0.75m–1m, during low tide and are dead. This is the same for all major outlying islands around these areas and is clear proof of the upheaval of the landmass by an average of 1 m. The exposed reef flats, in time, will become extensive beaches and the littoral forests are likely to extend further out, increasing the land area (Andrews and Vaughan 2005). According to Samir Acharya of the Society for Andaman Nicobar Ecology (SANE), Port Blair, the construction of improper bunds has resulted in parts of the bunds being washed off thereby sedimentation and choking of the corals. The partial destruction of bunds also results in waterlogging and associated health problems like malaria.

3.1.4 Impacts on mangroves

The mangrove creeks along the above mentioned areas have been affected due to the high tide waters not reaching the roots of mangrove trees, the water level stays 0. 75m–1m below the normal level in the creeks. This is causing root shock and eventually the drying of first three rows of mangrove trees and shifting of the stands into the creeks. These creeks have lost most of their substratum at the bottom, leaving only sand along the bottom, affecting fish and other creek fauna. The mangroves on the eastern side of the Middle Andamans, from Rangat Bay, east of Long Island and to the north of Baratang Island and in Shoal Bay area are submerged during high and low tides. This has resulted in the drying of mangrove trees and is causing the shifting of strands into the creeks. This is because the roots cannot breathe as they are not exposed. Mangrove roots have to be exposed for at least six to eight hours a day (Andrews and Vaughan 2005).

Box 3
Field Observations at Ross and Smith Island

A visual study of the creeks and bays around Smith and Ross Islands showed exposed mangrove roots due to uplift of the land. New mangrove recruits were observed beyond the edge in the new inter-tidal region. At Ross Island, large areas of exposed coral reefs due to uplift of land was observed.

3.1.5 Impacts on agricultural lands

Agricultural lands have been severely affected by inundation of seawater after the tsunami. The area damaged is assessed to be about 11,010 ha estimated to be one fifth of the total area that used to be under agriculture. Of the total affected area, 1730 ha was under paddy and other field crops and 9107 ha was under plantation crops. The number of farmers affected by the tsunami is about 6,000. It was observed that the inundated lands have become very fertile for fish and molluscs and are being used as fishing areas by local fishermen.

3.1.6 Salination of ground water and other freshwater resources

Seepage of seawater into shallow aquifers, wells and other freshwater sources was reported during the team's field visit to South Andaman and Havelock islands. These have direct and immediate implications for human health and agriculture. The extent of contamination must be assessed and remedial action taken in cases where salinity will not be flushed out rapidly through rainfall and other natural processes.

3.1.7 Impacts on fisheries

Sixty-nine fishermen were either reported dead or missing. Several fisher folk have become homeless. Many lost their fishing inputs such as fishing craft, fishing gear, engines, iceboxes, etc. The ice plants and cold storages of the Dept. of Fisheries were severely affected. The Department assessed loss to the government property, departmental staff and loss to fishermen as detailed below:

1. Loss to government property was estimated at Rs. 820.00 lakhs.
2. Two technical officials from Katchal Islands were reported missing.
3. 69 fishermen have been reported missing/dead.
4. A total of 2323 fishermen were directly affected.
5. 622 local made dongies (boats without engines) were fully damaged.
6. 471 local made dongies were partially damaged.
7. 316 engine fitted boats were fully damaged/ lost.
8. 294 engine fitted boats were partially damaged.
9. Several fishers lost their nets, fishing implements, marketing assets, etc.

In addition to this, the department also received about 1600 additional claims for loss to craft and gear which are being processed and will be approved by a committee consisting of the Assistant Director of Fisheries of the Zone (Convener), a representative of the Revenue Department of the area and Panchayat Raj Institution representative viz. concerned pradhan in rural areas/Ward Council in Municipal area/Tribal captain in tribal areas (ANI Administration 2005 b).

3.1.8 Impacts on structures

The study carried out by IIT Kanpur states 'While the damage in Little Andaman Island and all Nicobar Islands was predominantly tsunami-related, that in the islands north of Little Andaman was primarily due to earthquake shaking, though the tsunami waves and high tides were also an issue. In general, the building stock consists of a large number of traditional and non-engineered structures. Many traditional structures are made of wood, and they performed well in the earthquake shaking. However, a number of new, poorly constructed reinforced concrete (RC) structures suffered severe damage or even collapse due to shaking' (IIT 2005).

In addition, several so-called "rehabilitation and reconstruction measures" have inherent problems in them and are inconsistent with environmental milieu of the islands.

3.2. CRZ implementation in the context of the tsunami

The occurrence of the tsunami has enhanced the concerns about coastal management that civil society groups had. It has brought to the fore the issue of lack of implementation of precautionary clauses to safeguard coastal communities from natural disasters as well as the loss of natural ecosystems.

Through all the rebuilding and reconstruction initiatives in the Islands, CRZ regulations will need to be upheld. The uplift of the land in the northern group of islands and subsidence in the southern parts have created new terrestrial land mass is the northern parts while land has been lost in the southern parts of the Andaman islands. This has thus caused a change in the High Tide Line and consequently in the Coastal Regulation Zone.

There is therefore an urgent need to remap the HTL and the CRZ, as the present situation gives scope for violations of the CRZ Notification. Demarcation of the High Tide Line and categorisation of CRZ I, II, III and IV in areas both affected and unaffected by the tsunami and geomorphological changes is necessary to be done before undertaking reconstruction and rebuilding of the coast.

Lack of exact knowledge about CRZ areas and the activities permitted and restricted by the CRZ notification and the CZMP will affect the implementation of the notification and thus add to the already enhanced vulnerability of the coastal communities in the Islands.

3.3 Issues concerning reconstruction and rehabilitation activities and their impacts

The reconstruction and rehabilitation activities, which have been discussed here, are those, which are directly related to the coastal ecology and eco-systems, and those, which are likely to have direct or indirect impacts on the environment and on the health and safety of settlements.

3.3.1 Construction of dykes along the coast for agricultural restoration

As part of the agricultural restoration plan, extensive construction of dykes along the coast has been initiated. As per the report of the Administration, 'To stop the ingress of seawater into agriculture fields, 100 dykes of 50 meters each with 100 drop spillway with sluice arrangement will be constructed at an estimated cost of Rs. 4 crores . The administration has engaged the Andaman Lakshadweep Harbour Works (ALHW) for repair and reconstruction of dykes. Permanent dykes will be required in the South Andaman area to check the ingress of seawater, which will be constructed as part of the long term package' (ANI Administration 2005 a).

Box 4
Field Observations at South Andaman

Construction of dykes made of mud/stone was observed along the creeks at Garacharama and Sippighat.
A lot of quarrying of mud and stone was observed along the hill slopes in the vicinity, presumably for construction of the bunds. A stone-crushing site was also observed.
Another fact that was observed was that the seawater, which has entered inside, does not seem to have a path to flow out as the bunds probably are blocking some of the natural drainage channels.

3.3.2 Rehabilitation of mangrove forests

The draft State Development Report (NIPFP 2005 b) in its forestry chapter has proposed a management strategy for rehabilitation of mangroves based on the recommendations of the study carried out by the M.S. Swaminathan Research Foundation (MSSRF).

The report has recommended action plans for rehabilitation of mangroves, categorised on the basis of their location. These are:

a. Mangrove areas that are lifted beyond the reach of normal tidal inundation
b. Mangrove areas that are completely submerged as of now
c. Non-mangrove areas that have been inundated by the tidal wave

a. Mangrove areas that are lifted beyond the reach of normal tidal inundation.

In mangrove areas where the land has been elevated beyond 0.6m (0.6m to 0.8 m) resulting in the withdrawal of water, tidal inundation by digging trapezoidal canals has been recommended, to bring back the lost water regime and replenish the exposed and drying mangroves. After leaching of salts by the rains during the monsoon, fresh water loving mangrove species such as Exocaria agallocha, Hereteria sp., etc. can be planted. Continuous monitoring of biophysical conditions of elevated areas along with interventions—as the case may be—based on broad consultations with stakeholders, including local communities is also suggested.

b. Mangrove areas that are completely submerged as of now.

Continuous monitoring of changes in the biophysical condition of the submerged land should be carried out. If the area becomes permanently submerged to a depth of one meter or more, no mangroves could be grown there. On the other hand, if the level of submergence is shallow, mangroves belonging to the genera Rhizophora,, Ceriops and Bruguiera could be planted. These interventions should be first tried in small areas for further replication.

Areas of concern

Long term impacts of topographical modifications for mangrove plantation will need to be studied in detail before implementation. It is also to be debated if human intervention is necessary when nature takes its own course. The shifting of the tectonic plate is a natural phenomenon that resulted in the earthquake and tsunami, which led to destruction and devastation to nature and man. Nature has its own ways of recovering from natural disasters. One such disaster was the destruction of mangroves due to elevation of land mass. We observed (mangrove) recruits further into the creek, where they did not exist before. Nature (in this case mangroves) was finding its way back. Why then is human intervention required in the form of rehabilitation of mangrove forests?

3.3.3 Bio-shield programme

The MSRRF report has also proposed a bio-shield programme for coastal protection in non-mangrove areas that are inundated by tidal water or submerged by sea water. The report states that "Bio shield programme should be initiated immediately, using food for work and all feasible methods of mobilising the labour needed for the work. Trees species of priority such as casuarina, arecanut, pandanus, sea mahua, etc. could be raised. In the bioshield programme with non mangrove species, coconut, arecanut, pineapple, pandanus, casuarina, sea mahua, cashew nut, kudsu vine and vetiver grass, cinchona, Ficus sp. and littoral forest species could be tried. The choice of bioshield species should be based on the nature of soil. In areas suitable for raising bioshield with non-mangroves care needs to be taken to address the environmental issues" (NIPFP 2005 c).

Areas of concern

Some concerns regarding the need for a bio-shield and the choice of species have been raised in the ANET report (Andrews and Vaughan 2005): 'Currently no major management or conservation effort is required for the Andaman and Nicobar Islands. Planting and restoration programmes are currently not required and it must be remembered that mangroves, and casuarina plantations do not provide protection from tsunami. There is also no need for creating wind breakers, moreover, there are other native littoral species (other than casuarina) that can be used to reduce erosion along the coast'.

The usage of a mangrove shelter belt as an omnibus solution all along the coast is not feasible. From an ecological point of view, it may not be ideal to situate mangroves where they are not naturally found. The coast has a number of natural features, which include among others, coral reefs, rocky coastline, sandy beaches, littoral forests, creeks and mangrove forests and these features are formed where conditions are most ideal (Sekhsaria 2005).

3.3.4 Increase in water and chemical usage for reclamation of agricultural land

Reclamation of agricultural land will require significant amounts of water for flushing out the salinity and some chemicals to re-establish the land's buffering abilities. As part of the agriculture restoration package, scraping of salt and application of gypsum and organic matter have been proposed.

Areas of concern

The availability of adequate fresh water is a major concern. Leaching of chemicals into soil and coastal waters may happen as may consequent secondary impacts.

3.3.5 Changes in land use

There is an increased risk of land use change if affected agricultural lands are not rehabilitated to their earlier productive capacity. One of the examples of potential land use change is cited in the proposal for development of Fisheries in inundated agricultural fields (ICAR 2005). The report states the following:

Pre and post Tsunami Scenario of Brackish water Resources

The Islands have around 110,000 ha of brackish water/salt affected area besides 33,000 ha of mangroves. Before the tsunami ,about 680 ha was identified as suitable for development of brackish water aquaculture .After the tsunami, another 4000 ha has become brackish due to salt water intrusion and out of this 1000 ha have been identified as having the potential for aquaculture. The total area now available for development is 1680 ha where the saline/brackish water will be available for taking up aquaculture in ponds, cages, pens, etc. Currently, brackish water aquaculture is insignificant in the islands and only 10 ha is currently under culture.

Newly formed tidal pools and inundated areas

As a result of the tsunami, large tracts of agricultural lands were inundated with salt water, and which left certain areas under continuous inundation during spring tides. The water level and extent of water spread depends on the force of the tides. These newly formed brackish water areas can also be converted for aquaculture since they have become unsuitable for agriculture or horticulture due to salt water intrusion. The suitability of all these sites has to be ascertained through micro level surveys.

Areas of concern

A lot more thought and debate needs to go into permanently changing the use of such inundated land. These lands have now become saline due to natural reasons and causes. Steps that could be undertaken in this regard are:

1. The proposed micro level survey should first establish whether or not it is advisable to recover these lands.

2. If not, the land owner should be told that the land will have to remain inundated. Further,

a. The land owner should be given the option of retaining the inundated land provided he leaves the land inundated and uses it for purposes that are ecologically and environmentally acceptable.
b. If the owner does not wish to retain the land, he should be compensated for the land lost in a manner that is fair, just and equitable.
c. The land should then permanently revert back to Government to become common land.
d. The Government should then ensure that the inundated land is made part and parcel of the surrounding water body by removing man made blocks (if any have been made following the tsunami).

3. If yes, then a number of options arise.

a. It should be ascertained first whether the inundated land can be used as it is for different ecologically and environmentally acceptable purposes, and if so it should be used thus.
b. The land should then be made dry by using means that are ecologically and environmentally acceptable and put to appropriate use.

Environmental impacts of aquaculture

Shrimp culture is being banned in many places because of its adverse effects and it is not clear why this environmentally deleterious activity is sought to be introduced into the islands. Major environmental impacts of aquaculture are:

(1) the decrease in the regional ground water level
(2) sedimentation and destruction of coastal water flow
(3) the discharge of aquaculture-effluents
(4) chemical and human health hazards in general

3.3.6 Environmental sanitation in intermediate shelters

There seems to have been a lack of adequate study on the nature of appropriate technology for sanitation before implementation. Discussions with various NGO's working for R& R in the Andamans, revealed that this was primarily due to lack of time .In most areas pit latrines have been constructed, which are unsuitable in areas of high water table as in the Andaman and Nicobar Islands. These are potential hazards as they can lead to ground water and surface water contamination and consequently affect the health of the people.

3.4 New constructions and reconstructions in CRZ I

The Notification states that in CRZ I there shall be no 'new constructions'. The definition and interpretation of the term 'new construction' is important, although not explicitly stated in the notification (Sridhar 2005). The expert legal view is that there is a difference in the interpretation of the words 'no construction', 'no new construction' and 'no reconstruction'. The term 'new construction' need not apply to the reconstruction of an earlier authorised structure that was demolished or destroyed by the tsunami, if it is being reconstructed (as part of rehabilitation measures) provided the reconstructed structure is as per the same specifications, style and design as the earlier construction. There should be no increase in the area occupied or in the height of the construction as earlier.

This throws up several practical problems. There are no records available for several earlier constructions and it is also likely that a reconstruction will have different impacts on the environment than the earlier one, particularly if it is constructed using certain kinds of building materials.

Most importantly, the situation then and now (post-tsunami) has changed drastically, where safety of constructions and design are much more important.

The CRZ does not address any of these issues at present since these were simply not matters envisaged during the drafting of the notification.

The Notification is clear that no new constructions can be allowed within 500 metres of the CRZ I areas. This would include all new residential homes, temporary settlements, permanent structures, recreational facilities, cyclone shelters, public infrastructure facilities such as roads, bridges, schools, playgrounds, parks, medical facilities, hospitals and health centres, shops, etc.

For areas classified as CRZ IV, the CRZ Notification does not clearly specify any kind of building norms for reconstruction in the 50/200 m to 500m zone, as the case may be, as it does for CRZ III areas. It also does not specify norms for construction/reconstruction in the No-Development Zone as for CRZ III[2] .

[2] In the case of CRZ III, the notification specifies that in the No-Development zone (up to 200 m from the HTL) only repairs of existing authorised structures not exceeding existing Floor Space Index, existing plinth area and existing density are permissible, besides other activities that are permissible in the notification. In the 200–500 m zone, construction/reconstruction of dwelling units is permitted so long as it is within the ambit of traditional rights and customary uses such as existing fishing villages and gaothan and subject to the conditions that the total number of dwelling units shall not be more than twice the number of existing units; total covered area on all floors shall not exceed 33% of the plot size; the overall height of construction shall not exceed 9 m and the construction shall not be more than 2 floors (ground floor plus one floor) high. Construction is allowed for permissible activities under the notification including facilities essential for such activities. These include public rain shelters, community toilets, water supply, drainage, sewerage, roads and bridges, schools and dispensaries for local inhabitants of the area.

As mentioned in the case of CRZ I, practical problems related to lack of adequate land records, built up area and type of construction will also arise in CRZ IV areas.

In areas classified as CRZ II, the notification specifies that Reconstruction of the authorised buildings will be permitted subject to existing FSI/FAR norms and without change in the existing use.

In areas such as Port Blair, which is a municipal town, the issues related to lack of availability of land and building records, may be relatively less.

3.5 Supreme Court order post-tsunami permitting sand mining

Based on a report submitted by the Central Empowered Committee, the Supreme Court issued orders as an interim measure permitting extraction of sand as follows:

Removal for sand from beaches for the purpose of buildings/road construction etc. for a period of six months subject to the following:

1. Total quantity of sand removed from the beaches will not exceed the upper limit permitted by this court by order dated 7th May, 2002. (As per SC orders, the extraction allowed is 44,101.76 cubic metres based on phasing out at the rate of a minimum of 20% per year on reducing balance basis, the extraction in 2002 being 68,909 cubic metres).
2. No removal will be done from national parks and sanctuaries.

Areas of concern

The permissible quantity unless clearly mentioned along with areas from where they can be extracted, by name, is difficult to control and monitor. The quality of sand is not appropriate for construction and this may enhance the vulnerability of the coastal communities.

For the purpose of economic development in the aftermath of the tsunami, the Andaman & Nicobar Islands Administration is actively pursuing large scale development plans. What's more, the tsunami has only highlighted the incongruity of the current development model being adopted by the Administration for the Islands and this needs revisiting. One of the most lucrative sectors to the Administration is tourism – which is being currently being promoted as the economic saviour of the Islands. The problem with tourism is… is what the vision says: "…in the context of the tsunami…." A detailed analysis on tourism development plans is presented herewith.

PART 4

TOURISM IN THE ANDAMAN AND NICOBAR ISLANDS

4.1 Natural Disasters and Tourism in Small Island Developing Economies

Tourism as a means of livelihood to the economy of small islands like the Andamans needs specific attention. The significance of tourism in the island countries of the Caribbean and the Pacific and the adversities that arise out of unregulated tourism has been highlighted time and again. The Programme of Action for the Sustainable Development in Small Island Developing States (SIDS) stresses the point by acknowledging the important contribution of tourism to the development of many small island developing States, while noting that *"if not properly planned and managed, tourism could significantly degrade the environment on which it is so dependent* (Commission on Sustainable Development, 1996). It also issues a specific warning to small island developing states on the risks of over-reliance on tourism. It states: *"…economic recession in industrialized countries, their major source of tourists*, **and the impacts of tropical storms and cyclones to which many of them are particularly prone have devastating effects on the tourism sector and hence on tourism-based island economies"** (emphasis added). It is this aspect of tourism development that needs emphasis while analysing the impacts of the tsunami on the Andamans from the perspective of the tourism sector.

Small islands, by virtue of their unique geographic location, topography and geomorphic forces are much more prone to natural disasters of all kinds—tropical storms, hurricanes, earthquakes and tsunamis—that wreck havoc year after year on coasts around the world. Research indicates that in 2004, the month of August alone saw four successive hurricanes, which hit the Caribbean islands, particularly devastating Puerto Rico, Haiti and the Dominican Republic[1]. On tsunamis, the International Tsunami Information Centre has it that major Pacific-wide tsunamis have made their presence felt periodically each century[2] . Scientists also predict that global warming is increasingly threatening small islands like the Seychelles and the Maldives, which are also major tourist destinations, and a model that the Andaman wishes to adopt. Such a repeated battering of prime tourist locations by natural disasters has had governments in SIDS sufficiently worried. The Caribbean Tourism Organisation has begun serious discussions on improving disaster preparedness as a consistent spate of hurricanes devastates the region's tourism economies year after year. Ironically, in the Caribbean—as in most other island states—tourism has been advocated as the best alternative to traditional agricultural occupations, which has increased dependence of local communities and economies on tourism-based activities for income and employment[3]. In such a climate, the economic devastation caused by natural disasters increases manifold and often communities are unable to ever recover fully from its impact[4].

Tourism development in small islands is a risky proposition due to their exposure to periodical natural disasters and therefore that policies on tourism development in such regions much acknowledge this vulnerability and seek to reduce rather than exacerbate it.

The importance that the Andaman and Nicobar Islands Administration attaches to tourism is based on their vision statement, which states that the limited scope for industrial activity on the islands coupled with the decline in wood-based industry (pursuant to the

[1] 'Natural Disasters and Tourism', Harold Goodwin, International Centre for Responsible Tourism – Occasional Paper I, 28th February 2005

[2] Id. 1

[3] Statistics reveal that in 1998, Hurricane Gilbert is estimated to have cost Jamaica $4-6 billion, while the Eastern Caribbean Central Bank reports that in 1995, because of Hurricane Luis, Antigua and Barbuda saw losses of 4,000 to 7,000 jobs, an estimated 15-25% of the workforce. ('Caribbean: Plan to mitigate the impacts of natural disaster' by Dionne Jackson Miller, Third World Network.)

[4] In the Caribbean island of Dominica, industry estimates place the losses arising out of a single disaster – Hurricane Lenny that hit the country in 1999– at EC$ 5 million or approx USD 1.8 million. Data also reveals that the impact of the first major hurricane to hit Dominica – Hurricane David in 1979 – impact on the tourism sector was so severe that visitor numbers that had peaked the previous year, sharply declined by 30% in 1979-80 and never reached the same high figures again until 1986. ('Dominica; Natural Disasters and Development in a Small Island Developing State', The World Bank, Disaster Risk Management Working Paper Series No 2, October 2001.)

Supreme Court judgment dated May 7, 2002) has led to tourism being identified as a thrust sector for economic development, revenue and employment generation on the islands (Andaman and Nicobar Administration 2005 c). The state development report also suggests expansion of the present tourist season to throughout the year by expanding tourist attractions to aspects other than beautiful beaches of the islands. After the tsunami, the Administration announced as early as March 2005 that it was ready to receive tourists. In May 2005, when the President of India visited the Islands, he announced his vision to see 1 million (or 10 lakh) tourists a year, based on the Maldives model. Of late, the Administration has launched an aggressive marketing campaign in the print and electronic media with the catch phrase "Vitamin Sea" to promote its 'sea, sand and surf'.

Statistics on tourist arrivals indicate that tourism in Andaman and Nicobar Islands has picked up in the last 20 years and increased steadily over the last few years. There were only 10,000 tourists visiting the islands in 1980 and in 2003, the number had increased almost tenfold to 98,000. In 2004, it had been expected to cross the 100,000 mark[5] . Table 12 summarises statistics on tourist arrivals in the Islands since 1980.

Table 3
Tourist arrivals statistics in the Andaman and Nicobar Islands since 1980

Year	Domestic Tourists	International Tourists	Total
1980	7500	2096	9596
1981	8835	1170	10005
1982	13444	1102	14546
1983	14020	1817	15837
1984	16000	3152	19152
1985	20291	1264	21555
1986	20942	1791	22733
1987	31591	2085	33636
1988	34589	3663	38252
1989	39967	2392	42359
1990	27019	6697	33716
1991	32242	2248	34490
1992	35817	2435	38252
1993	35000	1771	36771
1994	50737	3798	54535
1995	64490	3849	68339
1996	67958	5796	73754
1997	73558	4724	78082
1998	74732	4915	79647
1999	77448	6035	83483
2000	81432	4684	86116
2001	85866	5249	91115
2002	90629	4707	95336
2003	93899	4281	98180
2004	105004	4578	109582

Source: 1980 to 1999: Dept. of Information, Publicity & Tourism, A&N, 2000 to 2004: Parliamentary Standing Committee on Home Affairs, June 2005. "Background Note on Developmental Activities in the Andaman and Nicobar Islands", Vol. 1.

[5] BBC News, "Post tsunami tourism in the Islands", Port Blair, Andaman Islands, 11 January 2005.

The State Development Report (draft) also states nearly 95 per cent of tourists to the Andaman & Nicobar Islands are domestic and many of them are government employees and their families who travel to the Islands to avail of their leave travel concession (LTC). The report notes that foreign tourists are mostly from the back-packer category and both domestic and foreign tourists contribute very little to island revenues.

Domestic tourists generally hail from the east or south of the mainland of India. These are mostly family tourists with 65% traveling by air while 35% travel by ship. Their average length of stay on the islands is between 4 to 5 days with an average expenditure of about Rs. 500 per day per person. The domestic tourist inflow peaks in the months of December and April that coincide with the holiday months in educational institutions.

However, compared to domestic tourists, the international tourists are more thinly spread throughout the year but even here a larger proportion prefer the sunny and mild winter months. On an average an international tourist stays on the islands for between 15 to 20 days. The normal per day per person expenditure is not very different from that by domestic tourists but the overall expenditure is between 4 to 5 times that of the domestic tourist largely on account of the longer duration of the visit. Due to the shorter duration of their tour, domestic tourists are often concentrated in the Port Blair area and do not spread out to other islands like the international tourists (Andaman and Nicobar Administration, 2005).

4.2 Tourism Policy of the Islands

The vision statement of the A&N Administration is contextualised in the following statement:
"The limited scope for industrial activity on the islands coupled with the decline in the wood-based industry pursuant to the Supreme Court judgement dated May 7, 2002 has led to tourism being identified as a thrust sector for economic development, revenue and employment generation on the islands. Keeping in view the fragile ecology and limited carrying capacity of the islands, the objective of the Andaman and Nicobar administration is to strive for sustainable tourism"[6] .
Therefore, the tourism vision is: "...to develop the Andaman and Nicobar Islands as an upmarket island destination for eco-tourists through environmentally sustainable development of infrastructure without disturbing the natural eco-system with the objective of generating revenue, creating more employment opportunities and synergise the socio-economic development of the islands." For the detailed note of the tourism vision (refer to annexure 2). For brevity's sake, the priority areas have not been included here. The thrust however is on privatisation, inducing private sector investment, opening up more areas in the islands for tourism and putting up large-scale infrastructure to facilitate tourism activities and tourist movements in the Islands.

A number of master plans exist for the Islands and among all these, the Ministry of Tourism (GoI) – WTO – UNDP plan has been retained by the vision for implementation. It is to be kept in mind that this report is fraught with controversies and many concerns have been raised by civil society organisations from India and the South Asian region regarding various aspects of the plan. A detailed analytical critique is provided in following sections of this chapter.

The tourism vision, if not anything else, is only rhetoric on sustainable ecotourism with little substance to back it up. On the contrary, the vision seeks to relax CRZ and other environmental guidelines for projects on the coast and obtain clearances for tourism projects on forest lands.

4.3 Tourism Policy in the Andamans and the Tsunami

For many years prior to the tsunami, it was hoped that tourism would be a thrust area for development in the Islands. It can be said therefore with reasonable certainty that prior to the tsunami, tourism was on a steady rise in the Andamans and the region was poised to register an increased inflow of tourists in 2004–2005 as well.

There are no reliable or precise estimates of the damage caused by the December 2004 tsunami to tourism in the Andaman Islands. Although not exhaustive or comprehensive, data from government sources gives pointers towards the possible extent of impact based solely on comparison of tourist arrival figures.

Other references to the impact of the disaster on tourism reveal that much of the loss to the local tourism industry came from the cancellation of bookings made by foreign tourists rather than physical loss of infrastructure or facilities on the island itself.

[6] http://www.and.nic.in/policy.pdf

Tragically, the only consolation for the local tourism industry was the large number of scientists, NGOs, relief workers and senior government officials who visited the Andamans after the disaster struck. Even in the absence of accurate data, the tsunami has undoubtedly adversely impacted the local tourism industry that has increased economic hardship for communities dependent on tourism. The more worrisome aspect in the post-tsunami context is the non-acknowledgement of the link between the disaster and the vulnerability of the island's tourism economy.

4.4 Tourism Policy in the Andamans: A Desperate Need for Change in the Light of the Tsunami Experience

The Tourism Policy for the Andaman and Nicobar Islands is a rather simplistic document serving very little of its purpose of providing guideline and principles for implementation. The one-page document simply states its vision to develop the Islands: *'...as a quality destination for eco-tourists through environmentally sustainable development of infrastructure without disturbing the natural eco-system with the objective of generating revenue, creating more employment opportunities and synergies and socio-economic development of the island'* (A&N Administration, Tourism Policy, 2003). Much of the ambitious plans and projects for tourism in the Andamans have been through a plethora of commissioned master plans prepared by a varied host of research institutes and interested parties, the details of which are given in the following section.

All the master plans do a thorough job of identifying areas within the Islands for potential ecotourism development, project ideas and need for strengthening tourism infrastructure in the region. However, neither the policy nor any of the plans have addressed the issues arising for tourism on the Islands in the event of adversities like natural disasters and possible ways of coping with them. This inapplicability of several tourism development ideas in the context of disaster-prone small islands can be elucidated with the example of tourism's dependency on the air transport industry. In the various tourism development plans for the Andamans, a repeated point of significance has been on the need to improve air connectivity to the islands and improving facilities at the Port Blair airport. Some of the ideas for improving air infrastructure are:

1. Providing international status to the Port Blair airport, commissioning additional airports in the Islands and providing inter-island helicopter, sea-air services (Background Note on Developmental Activities in the Andaman and Nicobar Islands, Vol. 1 of the Parliamentary Standing Committee on Home Affairs).
2. Declaring Port Blair as an international airport and transfer of the operations of the airport to the Airport Authority of India. (At present the operation are with the defence authorities in lieu of difficulties experienced in operating flights beyond the afternoon and due to want of clearance from the Air Traffic Control).
3. Opening of additional civilian airports in the Andaman and Nicobar Districts for landing of national and international flights as well as for operation of helicopter services and small planes for inter-island transportation.

If implemented successfully, the above plan might boost the tourist economy by improving accessibility to the Islands by easing, simplifying and speeding up travel arrangements. Experiences from across the world have shown that on the contrary, a "boosting" of the tourism industry by over-connectivity and reliance on foreign airlines has in fact deepened the tourism crisis during natural disasters and contributed to the rapid downfall of economies dependent on tourism.

The above example only illustrates the need for tourism development in the Andamans to be conscious of its increased vulnerability to externalities like disasters, which may obliterate the tourism economy if not developed sensitively and sensibly. Repeated experiences in the Caribbean have now led governments to incorporate elements of disaster-preparedness and mitigation of adverse impacts on local economies. The most important of these has been the realisation that because of its high vulnerability to be impacted by internal (political instability and security issues, outbreak of diseases like SARS) and external factors (terrorist attacks, recession in source countries, natural disasters), tourism **should not be the sole mainstay industry** for any economy, even more so for small island countries. Other important recommendations have been related to strengthening the insurance net for local investors and entrepreneurs to enable speedy recovery after a disaster.

Unfortunately, the government in Andamans has not recognised or addressed any of these important aspects of tourism development in the pre or post-tsunami context. On the contrary, the focus seems to

be on implementing the already unsuitable plans and reviving the sector by focusing on bringing in a large number of tourists.

4.5 A Basket Full of Tourism Master Plans for the Islands

In the last decade, at least six documents were prepared to lay down the framework of tourism development in the Islands. Apart from these, the Department of Environment and Forests has been given the mandate to identify potential ecotourism spots in the Andamans, which are incorporated in the divisional working plans of North, Middle and South Andamans for the period between 2003 and 2013 (see following sections for more details).

The various studies and master plans are:

1. 1987: Proposal for the Development of Tourism in the Andaman, Nicobar and Lakshadweep Islands[7].
2. 1994: Draft Perspective Master Plan for Tourism Development in Andaman Islands[8].
3. 1996: Ministry of Tourism (MoT), Government of India in association with the World Tourism Organization (WTO) had undertaken a project with United Nations Development Programme (UNDP) funding for developing a long-term strategic Master Plan to enable environmentally sustainable tourism in Andaman Islands.
4. 2000 (Oct): NEERI, Carrying Capacity Based Developmental Planning for Implementation of Master Tourism Plan in the Andaman Islands[9].
5. 2002 (May): Perspective Plan for Tourism Development in the Andaman and Nicobar Islands, Ministry of Tourism & Culture – Department of Tourism, Govt. of India in consultation with M/s A. F. Ferguson & Co., Management Consultancy Division.
6. 2005 (June): Background Note on Developmental Activities in the Andaman and Nicobar Islands, Vol. 1 of the Parliamentary Standing Committee on Home Affairs.
7. 2005 (August): draft State Development Report – Chapter 11: Tourism in the Andaman and Nicobar Islands prepared by Mr. Mukesh Anand, National Institute of Public Finance and Policy, New Delhi.

Before the tsunami, the islands were targeted "...as special focus area to develop the tourism sector to create more and more employment and to place them on the World Tourism Map"[10]. After the tsunami, the situation does not seem to have changed, rather there seems to be a sense of urgency to accomplish what was planned prior to it. In the presence of numerous master plans and outlays, the tourism vision has identified the MoT-WTO-UNDP master plan. For this reason, we have presented a detailed critique of the MoT-WTO-UNDP master plan in the following section.

The Background Note on Developmental Activities in the Andaman and Nicobar Islands, Vol. 1 of the Parliamentary Standing Committee on Home Affairs has detailed out the development activities and prescribed financial outlays for the same. There is too much of money being spent on infrastructure and it is highly capital intensive: to the tune of nearly 12 crores[11] . The study team observed that construction of road to the waterfall in Hut Bay, Little Andaman has already begun; the Note suggests this under scheme II – creation, maintenance of tourism infrastructure, pointing to a possibility that this may be implemented on priority. (Refer annexure 3 for detailed notes).

In the short-term objectives, the Note lays heavy

[7] The study was undertaken by a working group appointed by the Island Development Authority (IDA). The Working group was headed by Mr. Romi Khosla, a well known urban designer and architect, with representation from the MoEF, Ministry of Tourism (MoT), the Planning Commission, Department of Ocean Development, the Island Development Authority (IDA), individual scientists and the Lieutenant Governor of Andaman and Nicobar. The study took a planned environmental approach to tourism development. All the proposals were based on carrying capacity analysis of the islands, with due focus on benefits of tourism going to local inhabitants. The study recommended that all the tourism developments of future should be in coherence of environmental and socio economic characteristics of the Island and therefore avoid any replication of urban development and entertainment of the "mainland".

[8] This was a paper prepared by a former Secretary of IDA, responsible for tourism. The focus of this paper was on massive infrastructure development, including air and water transport infrastructure. Drawing from the criticism earlier plan received, this study made an attempt to discuss investments in Islands, and role of the private sector in tourism development. This study talks at length on improving the investment climate in the Islands, by revising CRZ norms, introducing new zoning regulations, building by laws and inters departmental cooperation.
Post 1991, Government of India drafted New Economic Policy and thereafter economy witnessed a gradual process of liberalisation and globalisation. The report done in 1994 is very much in coherence with the liberalisation agenda of Government. The groups and organisations having a pro-liberal stand appreciated the report's recommendations. On the other hand the report does not incorporate sections on environmental damages, regulatory framework and protecting the interests of local inhabitants of the Islands.

[9] On the advice of the Ministry of Environment and Forests, the UNDP commissioned the National Environmental Engineering Research Institute (NEERI) to undertake a carrying capacity based study incorporating the assessment of maximum tourism that can be sustained by the Islands, before recommendations in the Master Plan were to be implemented.

[10] Andaman Express, "Congress Demands to Declare tourism as industry for Andaman", 12 June 2004, Port Blair.

[11] source: Parliamentary Standing Committee on Home Affairs, "Background Note on Developmental Activities in the Andaman and Nicobar Islands", Vol. 1, June 2005.

emphasis on transportation to and between the Islands to facilitate tourist movements. These include improving air and water transport, related infrastructure like marinas for docking large cruise ships, procurement of water sport equipment, water sport complexes, a golf course at Port Blair, audio-visual and electronic display equipments, and procurement of tourist submarines.

In the medium term, the Note highlights: (i) increased connectivity—through domestic and international flights both regular and chartered, providing international status to the Port Blair airport, commissioning additional airports in the Islands and providing inter-island helicopter sea-air services; (ii) introduction of faster transportation like hovercrafts, catamarans, luxury boats and yachts; (iii) private sector led accommodation facilities, shopping malls, multiplexes and amusement parks, flyovers; (iv) water sports, scuba diving, cable car, tourist submarines and a hanging bridge; and (v) promote ecotourism, facilitating visa procurement and long term Restricted Area Permits.

4.6 Development Strategy for Environmentally Sustainable Tourism in the Andamans (1997)

The Ministry of Tourism (MoT), Government of India in association with the World Tourism Organization (WTO) had undertaken a project with the United Nations Development Programme (UNDP) funding for developing long-term strategic Master Plan to enable environmentally sustainable tourism in Andaman Islands.

The plan document has been divided into following volumes:

1) Volume 1: Tourism Structure Plan for the Andamans
2) Volume 2: Action and Development Programme
3) Volume 3: Basic Studies and Analyses

It is interesting to note that unlike other plans, which usually start from analysis and then goes to proposal, action plan and recommendations, in this the order of presentation has been reversed. Volume 3, which is the last volume, gives the detail analysis of plans, environmental legislations, socio economic profile and analysis of tourist attractions. Volume 1 and Volume 2 contain actual recommendations and action plans on spatial planning and institutional arrangements.

In the analysis of the existing scenario (Volume 3), the document has given adequate analysis of socio cultural characteristics, historical developments, economic profile and tourism potentials of the Islands. Economic review, analysis of tourist attractions and market prospects of tourism in the Andaman Islands have got a special emphasis in the report. The market potential and tourism promotion has been compared with other Island destinations such as Mauritius, Maldives, Seychelles and other South East Asian and Pacific locations. The possible "tourism products", (such as scuba diving, yachting, port fishing, boat cruises and general water sport) for making Andaman on par with other Island destinations are also suggested. Improvement of infrastructure and investment climate has been recognised as conditions for realising the potential of the Islands. The plan talks about environmental assets of the island as possible products to attract "high value, low volume, internationally competitive tourism"

Despite such in-depth analyses of market potential, tourist attractions and economy of the Island, it is striking that none of the chapters have been devoted to analyse the existing environmental capacities and threats of the Islands. There is a small section on Threats to the Environment, however for a plan, that calls itself "Environmentally Sustainable", the analysis is not adequate. Even this analysis does not recognise the fact that tourism has far reaching impact on the fragile ecosystems of the Islands. Environmental assessments in one of the plans outline that since, most of the forested lands in the Andaman are isolated from human habitation, the tourism development in other areas will not affect the forest ecosystem of the Islands. This analysis is not in accordance with the Shekhar Singh Committee's findings and other studies on forests of the Andaman, which reveal that biodiversity of Andaman is endangered and there are serious threats to it.

The plan states: "Although some pressures from encroachment by agricultural holdings have taken place in selected locations, notably along the Andaman Trunk Road, many forested areas are isolated from human habitation and economic activities and these are unlikely to cause significant degradation of forests."

Volume 1 talks about major spatial planning and zoning recommendations. The spatial development strategy has basically attempted the development of tourism in various zones. The concept of having such strategy is to have phased development in the islands, whereby most important "marketable attractions" get developed in the first place. The Plan mentions that such a spatial strategy finally leads to a

competitive tourism development and almost all the areas of Islands are brought under tourism phase by phase.

The different zones' strategy simply talks about how to improve the access to the zones, what are the products, and unique attractions that each of the zones could potentially offer the tourists. There is complete negligence of the fact that indigenous people inhabit these small islands and there is a need to safeguard their lifestyles and aspirations. Environmental considerations have been completely ignored. Instead the plan takes the position that CRZ is one of the major constraints in the development of competitive international tourism, and states in this context: "The innumerable restrictions on entry, movement and development must be relaxed or completely removed."

The plan is based on a very general understanding of the economic and social impacts. It assumes that employment generation will be a major benefit, estimated the number of jobs at 4,400, however it fails give details on the forms employment and the beneficiaries?

On social implications the plan skims the surface. It assumes that since the population in the Islands is of mostly of settlers, there prevails a cosmopolitan culture and therefore the local population will have no problem with foreign tourists. In the event of problems, the plan suggests that the solution is to conduct awareness campaigns with the local residents. The plan is silent on orienting tourists on environmental and socially sensitive tourism or having any code of conduct for tourists.

Volume 2 of the plan basically deals with the policy issues and proposed institutional arrangement for tourism development. The plan proposes following for removal or relaxation of institutional constraints:

1. Reduction of the coastal development prohibition zone from 200 m to 30 m behind the HTL in areas scheduled for tourism development
2. De-reservation of forest land in similar areas.
3. Removal of restrictions on the internal movement of foreigners and abolition of police entry permits for foreigners.
4. Simplification of procedures for entry into forests or protected areas.

The other institutional arrangement championed by the plan is private sector participation. On an overall basis, what the plan really lacks is sensitivity towards indigenous people; local inhabitants and above all the fragile ecosystem (refer annexure 4). With the thrust on relaxing all the regulations (including the CRZ), to make Andamans a friendly destination for international tourists, the recommendations strongly promote neo-liberal economic ideologies, which cannot be the basis of a broader policy directive for the Islands. Secondly, the rationale of spatial planning and zoning is not clear. Reference to building by laws, CRZ, 73rd and 74th Constitutional Amendments and other important environmental legislations are not made in spatial planning.

The Tourism Vision of the Andaman and Nicobar Islands, which was formulated in May 2002, spells out ecotourism and creating benefits to local people as one of the objectives. The preservation of natural and cultural heritage of the Islands and socio-economic development has been targeted. The vision document outlines the implementation of the plans prepared by Ministry of Tourism – WTO and supported by UNDP as one of the policy measures to be taken. In a scenario where number of policies, plans and legislations exist, and there is a lack of cohesiveness among them, implementation of any of these without getting validation from ground realities is not an appropriate way to address the issues of the tourism sector. There have also been suggestions of linking tourism in Andamans with the tourism circuits of Thailand. A tie-up with Phuket has occurred and foreign tourists are expected to trickle in through this route. There is fear across various stakeholders and civil society groups that such development would further affect the sustainability aspects of Andamans and would make it more vulnerable (see section below).

Some of the plans have also considered environmental carrying capacity as the guiding factor for tourism development, and these are based on rules, norms and standards made at different levels and applied to the local area. There is a lack of sensitivity towards indigenous tribes who have already been exposed to exploitation by the tourists and now are on the verge of extinction.

4.7 In Addition to Master Plans

The Ministry of Tourism had announced an enhancement of private investment from Rs. 5 crore to Rs. 100 crore in 2004 to build super resorts and luxurious hotels in both the island groups of the Andaman and Nicobar Islands and Lakshadweep[12]; ten islands were identified in Andamans including Havelock and North Passage. The Directorate of

Information, Publicity and Tourism, the nodal agency for tourism in the Islands, had also proposed a new ecotourism circuit at Baratang in November 2004[13]. The then Lt. Governor Dr. Kapse had earlier inaugurated eco-huts at Mount Harriet National Park for 'eco-tourists" in July 2004[14] .

As mentioned earlier, the Department of Environment & Forests has also embarked on mission to open up as many islands for ecotourism as possible. The details of the ecotourism activities are mentioned in the divisional working plans approved by the Supreme Court [15].

Interestingly, and not to be left behind in the tourism race, the Fisheries Division of the Indian Council of Agricultural Research has also recommended to the Andaman and Nicobar Administration to develop Port Blair as a major game fishing destination in consultation with the tourism department (ICAR 2005). Apart from the above, the most significant and controversial plan has been to link Port Blair with Phuket – the twinning of the cities agreement.

4.8 The Twinning of Cities Agreement – Fraught with Controversies

Discussions between the two parties - the Port Blair Municipal Council and Phuket Province of Thailand - had commenced in 2003 when a high level delegation from Phuket had visited Port Blair. This was in reciprocation to the visit of the delegation from the Andaman Chamber of Commerce and Industry that had led 116 members to Phuket in November 2003. The agreement between the Port Blair Municipal Council and Phuket Province of Thailand was finally signed on 29th June, 2005 at Phuket. This agreement is under the guidelines of the Ministry of Urban Development for twinning of cities for the promotion of better understanding and exchange of useful information. Tourism promotion is only one aspect of the agreement[16].

The twinning of Phuket and Port Blair will have devastating effects on the Andaman archipelago. While fostering tourism, stepping up trade and commerce, promoting education and culture seem reasonable for both countries, there are several long-term ecological, economic and cultural implications that need to be evaluated before embarking on such a project.

According to Samir Acharya, Secretary of the Society for Andaman and Nicobar Ecology (SANE), "The idea of Phuket as a model for tourism on the Andaman Islands is frightening. Phuket used to have excellent coral reefs, pristine forests and was engaged in subsistence agriculture and fisheries before the trans-national companies came and 'developed' the island." Mr. Acharya adds, "We do want development of tourism in the islands, but it should not be mindless. It should not result in a complete waste of our natural resources"[17].

It has already been seen that Phuket has lost much of its natural riches and resources to the unplanned and unregulated tourism industry. "A survey by National Geographic Traveller magazine found that Phuket is "getting ugly" as a travel destination. Phuket was third from the bottom out of 115 popular destinations worldwide. Resort owners in Phuket have run out of beach to build on, and have run into opposition in building artificial islands as resorts. All the more reason for them to salivate at the beautiful Andamans", writes Madhushree Mukherjee[18].

[12] http://www.newindpress.com/NewsItems.asp?ID=IEH20040605142646&Page=H&Title=Top+Stories&Topic=0& "Super resorts planned in Andaman & Nicobar, Lakshadweep" 6 June 2004.

[13] Andaman & Nicobar Administration, Directorate of IP&T, "New Eco-Tourism Circuit at Baratang" – press release, Port Blair, 4 Nov 2004.

[14] The Daily Telegram, "Lt. Governor inaugurates eco-huts at Mount Harriet", Port Blair, 18 July 2004.

[15] The various islands are:
1. North Andamans
Note: this working plan was in draft stage at the time of study (i.e. September 2005) and is not yet approved by the Supreme Court
a. Saddle Peak
b. Ross Island
c. Kalipur beach (photo)
d. Kalpong hydro power project
e. Ramnagar beach
f. Karmatang beach
g. Ray Hill
h. Curlew Island
i. Interview Island
j. Sound Island
k. Stewart Island
l. Nariyal balu
2. Middle Andamans
a. Long Island
b. Guitar Island
c. Cuthbert Bay
d. Merk bay
e. Barren Island (with a live volcano)
3. South Andamans
a. Rutland
b. Wandoor
c. Chidiya tapu
d. Mount Harriet
e. Shoal bay
f. Constance Bay

[16] The Daily Telegrams, Twinning of cities agreement between Phuket & Port Blair, Port Blair, June 2004.

[17] Noble, Tanaz K. TEHELKA, "After tsunami, the Andamans brace for tourist invasion", New Delhi, August 2005. http://www.tehelka.com/story_main14.asp?filename=Ne090305After_tsunami.asp

[18] Mukherjee, Madhushree on email to andamanicobar@yahoogroups.co.in 2 July 2004.

The important lesson that is learnt from the tsunami is to protect natural barriers and ecosystems that will ensure integrity of the coastline. The twinning of cities plan only means ushering in large scale infrastructure and constructions like roads, jetties, airstrips, hotels, resorts, etc. and this will have immense pressures on the natural resources of the region. The inter-island traffic that will be caused by large ships frequenting the region and resultant emissions and pollution will spell disaster for the fragile and endemic marine life in the region, endangering dolphins, reefs and fish, and contaminating the waters. It should also be kept in mind that the islanders are struggling for their own survival. Potable water is in short supply on the islands and increasing tourist numbers will add immensely to the pressure.

There are social implications, which include narcotics and human trafficking that will strip the islands of its riches. The added fear is that the twinning plan will "turn the islands from an idyllic tropical backwater into a sex tourism hotspot". "Presently, tourism in Thailand [is] heavily dependent on the sex industry. Most of the tourists visiting Phuket are single white males and if, after [establishing links] the Andaman and Nicobar Administration is planning to bring those tourists here, we will definitely need thousands of professional sex workers very soon," said Samir Acharya, Secretary of SANE. Subhasis Ray, General Secretary of Healthy Environment by Less Pollution (HELP), another NGO, alleged that women from Myanmar are regularly smuggled in and sold to sex trade operators in Thailand. "We certainly do not want this type of tourism industry here in Port Blair," he added[19].

There is the added concern that "foreign businessmen investing in a big way will take the lion's share of profits out of the islands. The Andaman's resources—its beauty, freshwater, beaches, corals, forests—will be used up or damaged, for very little actual return. Local, controlled tourism efforts will probably yield greater dividends in the long run"[20] .
As Mr. Acharya points out "The twinning may have some positive outcomes in terms of setting up joint processes towards developing capabilities for waste management and water harvesting for both islands. The Andaman administration owes it to the archipelago's residents to work on a priority basis toward building these capabilities, while also exploring models of tourism appropriate to the island ecosystem and with demonstrated long-term benefits for its inhabitants" (Acharya et al. 2005[21]). Mr. Acharya also pointed to these issues in a national consultation on state of Indian tourism held in Bangalore in July 2005.

4.9 Current tourism related problems in Andamans

The ability of the fragile ecosystem of these islands to withstand the impact of tourism is limited. Apart from disturbance to the forests, there is also disturbance to the marine and coastal ecosystems, especially to the coral reefs. This is evident in the case of the Wandoor National Park (in the two islands open to tourists, Jolly Buoy and Redskin), where the coral reefs have been almost completely destroyed. There is also the problem of water availability, disposal of garbage, generation of electricity and the construction of other infrastructure. Also, since the food and other goods sold in the Islands are imported form the mainland (and the government pays a hefty subsidy for their transportation to the Islands), it is unlikely that the expenditure by the tourists for goods and services in the islands, would result in any net benefit to the economy. In fact, tourists coming by ship are often a net drain on the economy, as the government subsidy on each passenger ticket is also very high (Shekar Singh Committee Report, 2002).

Unregulated and large scale tourism destroys the very resources, which create the tourism opportunities in the first place. These impacts of tourism get further magnified in the case of fragile ecosystems such as coral reefs and mangroves. The environmental, social, cultural and economic impacts, though visible are often very difficult to quantify due to the complex and long term nature of these impacts.

A study done on Havelock Islands states: "Havelock Island is a good example of minimal tourism development and agricultural production which, nonetheless, appear likely to have a significant impact on marine and terrestrial ecosystems. These types of impacts are likely to be vastly multiplied as tourism pressure increases and as permit controls are loosened (Fried and Anex 2004)."

[19] The Phuket Gazette, "Andaman NGOs slam plans for Phuket links", 27 September 2003.

[20] Mukherjee, Madhushree on email to andamanicobar@yahoogroups.co.in 2 July 2004.

[21] Samir Acharya et al, July 2005, letter to Ms. Sonia Gandhi, Chairperson, National Advisory Council, see also SANE newsletter, October 2003, and www.sanctuaryasia.org/

Environmental impacts

A few environmental problems observed during the course of this study associated with tourism currently in Andamans are:

- Location of tourism infrastructure very close to the HTL; in some cases it is within a few metres
- Extraction of material from the beach, especially sand, shells and corals for construction and landscaping
- Permanent structures like the government-owned Dolphin Beach Resort at Havelock that probably have been created by clearing forests and flattening sand dunes, leading to habitat fragmentation and degradation
- Destruction of mangroves forest resulting in severe beach erosion and sedimentation that would choke the coral reefs
- Construction of sea walls leading to severe erosion in and around the area
- Proliferation of non-biodegradable wastes like plastics; there seems to be nil sensitivity on this particular issue in the Administration and the public in general
- Contamination by sewage and sanitary wastes because of disposal systems being close to shore.
- Possible impact on fish and crustacean populations due to increased catch for tourism consumption
- Impacts of diving activities due to anchoring on corals and breakage of corals due to trampling by divers.

With respect to tourism in protected areas of the Andaman Islands, there is a problem of the lack of adequate monitoring of tourist activities and behaviour in protected areas, as was noted by the study team. At least in the case of Smith and Ross Islands that this study team visited, there were no guides or guards at the beach to monitor tourist activities or to ensure their safety.

Socio-cultural impacts

Foreign tourists are known for moving around in scanty clothing; introduce and display a very foreign way of life to the local population. In Havelock, the local people have already raised concerns over the display of skin by foreign tourists. In a discussion with the women in Havelock, the study team elicited from them that they don't allow their children to move on the beach during the tourism season. Such self imposed regulations alienate the local people from their own surroundings. The local panchayat member had also requested the resort owners to advise tourists from going around the beach, and the village, scantily clad but this has not stopped so far. This was reported to the study team during their field visit in Aug 2005.

For a typical pattern that this kind of tourism brings in is local populations aspiring for the kind of standards of living that foreign tourists symbolise. This causes shifts in local consumption patterns towards products preferred by tourists; usually western products.

4.10 Future Trends in Tourism Development in the Islands

As per the tourism plan of the Administration (ANI 2005), for the future development of the tourism sector, the emphasis is on construction and development of infrastructure and investments for the beautification of the environment and the management of beaches. The activities listed to be taken up in future include the building of roads to several tourist spots in wilderness areas including to the waterfall at Little Andaman, construction of fast food centres and other amenities and repairs of sea walls. A great deal of emphasis is given to the development of capital intensive water sports. There seems to be no concern for the potential environmental impacts of these plans and activities barring a passing mention to ecotourism. There is also no mention of development of human resources and training of local people so that they may generate livelihoods from these activities.

There is a sceptical approach towards policies and regulations for environmental protection in the chapter on Tourism of the State Development Report. It states, "The stringent environmental, forest and CRZ regulations may inhibit any development purely as a policy inducement or policy constraint. There is thus a need to take another look these regulations based on widely accepted international practices." ANI Administration 2005 c).

The proposed tourism plans for the islands and the revised CRZ notification in which the NDZ has been reduced to 50m for tourism promotion and development, coupled with the lack of appropriate and adequate building norms and the existing levels of stress on natural ecosystems, increase the vulnerability of the human and natural communities of the Islands. If these plans are realised, they could also pose increased risks to tourists.

4.11 Local Tourism Entrepreneurship in the Islands: The case of Havelock Island

Havelock was one of the first islands that were developed for tourism during mid 90s. The international tourists who come to Havelock are mostly from Israel. Germans, Italians, Japanese, Americans and Croats also frequent the island and these tourists are mostly divers. Domestic tourists who stay for long durations are usually an elite crowd. The island however gets numerous day visitors, the statistics of which is not easy to generate.

All the beach resorts are locally owned either by people from Havelock Island itself or from Port Blair. The resorts that are operational between Settlement No. 1 and Settlement No. 5 are:

1. MS Resorts (next to the jetty)
2. Bay View Inn
3. Happy Resorts
4. Amazon Beach Resort
5. Eco Villa
6. Café del Mar
7. Pristine Beach Resort
8. Sunrise Trust Complex
9. Orient Legend Resort
10. The Wild Orchid
11. Dolphin Resorts (Govt. Owned)
12. Silver Sands

The owner of Eco Villa has also constructed 10 cottages and 10 huts called Green Leaves Resort at Kalapathar. Apart from these resorts, there are facilities for tented accommodation created by the Department of Environment and Forests (DoEF)at Radhanagar Beach. A private resort, Jungle Resort owned by Barefoot Airtours Pvt. Ltd. is also located here.

On Havelock Island, it was observed that all the resorts are located close to the beach, and probably within 40m on an average. Discussions with all resort owners and managers revealed that none of the resorts have clearances from the DoEF or the Revenue Department. It was reported in one of the interviews that only one resort, Sunrise, was given a commercial certificate from the Revenue Department. This is a peculiar problem as apparently there are no clearance mechanisms in place [22].

This observation is obviously on the lack of clarity on clearance mechanisms. As this is revenue land, the onus of providing clearances and to look into matters of CRZ violations would rest with the District Collector. On the contrary, the responsibility is laid on the resort owners and they are left to themselves to figure out the application and clearance mechanisms for their enterprises. The non-implementation of CRZ hardly becomes a matter of concern for the respective authorities.

Most of the resorts are made of local material like bamboo, cane and thatch, except for Happy Resorts and Silver Sands, which are made of cement. It was also observed and documented that sand from the beach was being used for construction, including coral shingles and shells being used to line pathways. A detailed study on clearance mechanisms and natural resource use by the tourism industry would be imperative prior to any future development plans.

All the resorts employ local people for the various operations. During the tourist season, cooks are brought in from states as far away as Himachal Pradesh. The reason behind it is that Himachal Pradesh gets a large number of Israeli tourists and the cooks there have mastered the art of Israeli cuisine and hence they are brought to Havelock during the tourist season (October to February) [23].

Contrary to the tourism vision, which aims at low-volume high-end tourists, the local entrepreneurs want backpackers to be encouraged. These tourists, they said, stay for about a month and this is beneficial to the resorts. The issue that the backpackers face is obtaining permits. The Administration usually issues a permit for 20–25 days when they are actually eligible for 45 days. When they approach the authorities for extension, they are sometimes harassed. The resort owners were of the opinion that the backpackers should be given three month permits. In personal interviewers conducted with the resort owners during this study team's field visit, all of them were of the opinion that the low end tourists demand very less infrastructure; they are happy with thatched huts and all require are clean beds, toilets and simple food. They usually lie around the beach reading books when they are not swimming, snorkelling or diving [24].

The Administration has been aggressively promoting tourism after the tsunami and the thrust is on bringing in 'low volume high end' tourists to the Andamans, as is also evident from what the numerous tourism master plans have stated. High end tourism warrants high end infrastructure, which would be highly resource intensive in character. Can the Islands, already stressed under numerous impacting factors and a burgeoning settler population, support such a profile of tourism is a crucial aspect that has not been touched upon, leave alone seemed to have been thought of by the Administration. Instead all

[22] Pers. Comm. with Samir Acharya, Aug 2005.
[23] Pers. Comm. Mr. Sajan, Eco Villa, 27 August 2005.
[24] Pers. Comm. Mr. Alex Francis Jesurajan, Pristine Beach Resort, 27 August 2005.

environmental concerns seemed to have been thrown to the winds.
The high-end tourism infrastructure and private sector investment that the Administration has planned will, apart from large scale ecological damage, usher in a different profile of tourists. Apart from creating conflicts with local entrepreneurs over business operations and resource use, the tourism envisioned by the Administration will displace them and affect livelihoods of local people that depend on current low scale tourism that happens in Havelock.

The current form of tourism development envisaged for the Islands is unsustainable because it seeks to lower the threshold of the coastal development prohibition zone from 200m to 50m behind the HTL in areas scheduled for tourism development; de-reserving forest lands in similar areas. This is against the order of the Supreme Court in 2002 which has directed that tourism should be low impact and sensitive to the ecological context of the Islands.
As per the recommendations of tourism master plans, like the Minstry of Tourism (GoI) –WTO - UNDP, simplification of procedures for entry into forests or protected areas is reflected in the working plans of the Dept. of Environment & Forests that has identified about 40 islands for 'ecotourism' development.

In the presence of numerous master plans and development notes, there is concern about why so many in the first place, and secondly why the tourism vision has only identified the UNDP-WTO master plan prepared in 1996 as the guideline for tourism development. Has this been done on the basis of scientific analysis and participatory processes is an area of serious concern. The apathy of the Administration is evident from the fact that such a statement has been included in the tourism vision for the Islands. Probably there is no instance so far of a government policy directive openly stating that a non-government agency's recommendation has been made the basis of its action: that too regarding the implementation of a resource intensive industry, with a proven track record of colossal environmental impacts, in a sensitive and vulnerable ecosystem like Andaman Islands. Never do government policies accept a document outside government and state it in the policy itself. It is equally appalling that there seems to be no voice of concern from any quarter of the Administration on such processes, leading to raise a question on what the process of approval of such master plans is, and monitoring.

RECOMMENDATIONS

COASTAL ZONE MANAGEMENT

1. Jurisdiction - One of the limitations of the CRZ notification is that it does not regulate anything beyond the coastal regulation zones. While the CZMP could address some of the activities beyond the 500m or 200m area on the basis that although they may be outside the CRZ, they potentially impact the CRZ, the effective regulation of the gamut of activities that have the potential to impact the coast can only be achieved if other laws governing development projects, urbanisation and economic growth incorporate these concerns. Many port related activities and other off shore activities are therefore not adequately regulated. There is a critical need to examine these laws and determine the changes that are needed in them so that these concerns may be addressed.
   Actions needed:

1.1. Extend the jurisdiction of CRZ to include the inter-tidal area in all zones

1.2. Urgent need to extend the CRZ seaward after detailed study to ascertain the area for impact from land based activities
   Action by: MoEF

2. At present no specific EIA procedures and guidelines for project clearance are mandated in the schemes of the CRZ.
   The present procedures for environmental clearance are not laid down in the notification. It is not known if a standard procedure has evolved through practice. Therefore it is impossible to know if existing procedures are coherent or adequate in assessing potential impacts of proposed projects.

2.1. Action needed: Detailed project clearance guidelines need to be given in the CRZ notification complimented by EIA procedures for all project clearances
   Action by: the NCZMA and A&NCZMA

3. Ambiguity - None of the amendments have sought to clarify some of the other ambiguities and uncertainties such as the definition of 'local inhabitants', 'traditional rights and customary uses'.
   The MoEF has still not issued a consolidated gazetted notification incorporating all the changes to the original notification making the interpretation of the various clauses a real challenge

3.1. Action needed: Definition of local inhabitants and 'traditional rights and customary uses' to be defined and identified in the context of the CRZ notification.
   Action by: Civil Society and Government in consultation with local coastal communities

4. For the effective implementation of the CRZ notification, the identification of the new HTL and the remapping of the CRZ is critical. This needs to be undertaken urgently so that all reconstruction efforts could also be taken up as per CRZ regulations. The new maps generated will need to be made available to all the local administrative bodies that are charged with the responsibility of implementing the notification.
   Demarcation of the CRZ - The HTL and LTL are to be demarcated only by authorities designated by the Central Government but the Government of India is still in the process of arriving at a common methodology for HTL/LTL demarcation. In none of the states has the HTL demarcation exercise been completed at the ground level.
   Actions needed:

4.1. Demarcation of the HTL and the LTL needs to be done at the earliest

4.2. The new maps and plans should also be widely distributed and made available at important offices for public examinations at all times and also posted on the official websites.
   Action by: MoEF, NCZMA and A&NCZMA

5. The central and state level processes of granting clearance to projects proposed in CRZ areas, needs to be clearly understood through several case studies of cleared projects covering various sectors and activities. Following this, a detailed critique of the process should be developed for the MoEF, which will highlight its strengths, weaknesses and recommendations to enhance effectiveness of the process as per ICZM objectives. Good practices that are part of clearance processes under the EIA notification and other laws could be incorporated into the CRZ clearance process. As in the case of the EIA notification, the CRZ notification should have one or more schedules that clearly list the kinds of projects mandating clearance from state or central government agencies.
   Action needed:

5.1. In order to understand the true status of implementation of the CRZ notification until now, detailed studies asking the following questions will need to be undertaken:

a. How many of the development activities on the coast have been established legitimately following all due legal regulatory procedures?

b. How many of the legally established units comply with the conditions imposed on them?
c. How many units have been established without following all the environmental regulatory procedures?
Action by: Peoples Movements and Networks, Civil Society Organizations in consultation with the A&NCZMA.

5.2. A&NCZMA suo moto needs to remove the ambiguity in its functioning by bringing into the public realm and disclosing practices they use to give clearances for projects

6. In order to prevent any further encroachments and rampant immigration, the Administration should regulate the entry of people to the islands by having the Islands declared as an Inner Line Area and by imposing relevant restrictions under Section 3 and other provisions of the Environment (Protection) Act of 1986.
In addition, entry to the more vulnerable and forested areas of the Islands should be restricted. Once this regulation is in position, the administration should in a time bound manner issue identity cards to all the residents so that there is no gap in the period of identification and issuance of ID cards.
This recommendation of the Shekhar Singh committee report which resulted in the SC ordering that ID cards must be issued within six months of the order must be supported and its implementation demanded at all levels of planning and decision making on issues of the Islands. This is the single step that will ensure that problems of the islands can be maintained at a manageable level rather than go completely out of control.

6.1. Action needed: The Inner Line Permit process needs to be put in place at the earliest.
Action by: ANI Administration.

7. The recently concluded process to draft the National Biodiversity Strategy and Action Plan (NBSAP) also resulted in the drafting of a Biodiversity Strategy and Action Plan (BSAP) for the Islands. The document takes a detailed look at the causes for loss of ecosystems and recommends several steps for the conservation of these ecosystems. It also prioritises some actions to be taken up urgently. These recommendations and action plans need to be supported and their implementation by relevant agencies needs to be advocated for by civil society groups.

8. Several sectoral studies need to be undertaken to assess if the legal machinery in place is effective enough to address concerns regarding development of the islands. Two future studies of immediate significance are described:

a. A study will need to be undertaken to identify if the existing building norms are effective enough to protect the island's populations and natural resources. If not, it will be necessary to study the best practices followed in other island ecosystems and advocate for necessary changes in our regulations and their implementation.
The new National Building Code 2005 has for the first time laid down codes for non-engineered buildings including stabilised mud construction, buildings in stone and brick and bamboo structures. The section on non-engineered buildings lays down standards for innovation, technology and practice in the use of material. Performance-appraisal certificates have also been extended to non-engineered construction processes. The National Building Code 2005 was a response to the scale and magnitude of natural disasters such as earthquakes, cyclones and landslides that have been experienced in recent years. The maximum impacts of these disasters have always been on non-engineered structures. In the Andaman Islands where about 72.1% of houses are semi permanent or temporary (Census 2001), largely comprising non–engineered buildings, the implementation of these standards is imperative.
b. It would be useful to commission a detailed study of the Panchayat and Municipal regulations on land use and building to understand the extent to which environmental considerations are built into them. If the clauses are found to be inadequate or conflicting with environmental considerations, then appropriate changes to these regulations and corresponding implementation mechanisms need to be recommended.

9. All the plans being drawn up for the reconstruction of dwelling units and infrastructure need to be reviewed on the basis of whether they are in keeping with the CRZ notification and the existing building norms.

10. It is important to take up education and awareness building programmes among implementing and monitoring agencies and civil society groups and citizens about the importance of regulations such as the CRZ and their role in protecting the coastal environment and local communities. The Shekhar Singh committee report had recommended that "All officers of the administration, including forest officers, should undergo an orientation training of at least five days, every three years, to acquaint themselves with the ecological characteristics of the Islands and the options available for their economic development in an environmentally and socially

sustainable manner. Officers being posted from the mainland to these islands should be so oriented within three months of their posting"

11. It is unacceptable that the CRZ notification was amended to allow tourism projects in some identified areas beyond 50m of the HTL when the earlier limit was 200m. Although the amendment states that this reduction is based on the ICZMP study, it is important to note that the study was neither complete nor had it been discussed with stakeholders in the islands before this amendment was made. This amendment therefore should be revoked and if the suggestion to allow for tourism projects within 50–200m of HTL remains. Then the suggestion needs to be viewed on the basis of the lessons from the tsunami affected tourist areas and the proneness of coastal areas to disasters which make tourists vulnerable. A decision should be taken on the suggestion only after these discussions and considerations are given due thought.

11.1. Action needed: The amendment to allow tourism projects beyond 50m of HTL should be revoked.
Action by: MoEF

12. Recommendations for the introduction and use of simple and effective and appropriate technologies, made time and again by researchers, scientific institutions and NGOs, such as compulsory rain water harvesting in municipal areas, a gradual shift to organic farming and research to find practical and low cost design and material options for construction need to be supported.

13. Besides the factors mentioned above, inadequate disaster management planning and lack of natural hazard insurance for buildings increase the vulnerability of coastal communities. In the aftermath of the recent tsunami, the urgency of these policies has come to light and this need to be addressed without any further delay.

14. All existing tourism master plans and documents should be shelved and the form of tourism that would be sustainable for the islands needs to be reconsidered based on current contexts and developments, through participative processes. A notification to this effect should be brought out for public information.
Action by: Dept. of Information, Publicity & Tourism, A&N Administration.

15. Tourism cannot be made the mainstay of the economy but it needs to be linked to other sectors.

16. Tourism development should be in accordance with the order of the Supreme Court, based on the recommendations of the Shekhar Singh Committee report, which emphasised on a low permanent infrastructure based approach to tourism.

17. New areas should not be opened for tourism, including for ecotourism, unless proper impact assessment studies have been undertaken and made available for public scrutiny and intervention.

18. Current local tourism enterprise in Havelock and Neil needs to be regularized and supported.

19. The master plans have also recommended removal of restrictions on the internal movement of foreigners and abolition of police entry permits for foreigners.
They also recommend opening up Nicobar Islands for tourism development and linking with South East Asian tourism destinations for tourism promotion. This has resulted in the linking up of Port Blair with Phuket for tourism.
Actions needed:

19.1. Nicobar Islands should not be opened for tourism.

19.2. The Inner Line Permit process needs to be put in place at the earliest.

19.3. The Phuket – Port Blair tourism linking plans need to be terminated.

ANNEXURE 1

Andaman & Nicobar Islands

The Andaman and Nicobar Islands is the largest archipelago in the Bay of Bengal. Aligned in a north-south direction, they comprise 572 islands, islets and rocks congregated into two major groups—the Andaman and the Nicobar groups. The Andaman group, which is located closer to Myanmar, consists of 550 islands, islets and rocks and covers a land area of 6408 km^2. This group includes large islands such as the Middle Andaman, North Andaman, South Andaman, Baratang and Little Andaman. The Nicobar group consists of 22 islands having a total land area of 1841 km^2. Great Nicobar (the southernmost island of the Nicobar chain) is the largest island (1045 km^2). The total area of the Andaman and Nicobar islands is 8249 km2 and the total length of islands' coastline is about 1962 km, accounting for about one fourth of the total coastline of India.

The total population of the Andaman and Nicobar islands is 3,56,152 as per the 2001 census. The migrant and settler population of the Islands comprise about 91.70% of the total population. In the Andaman Group, the migrant and settler population comprises 99% of the population and in Nicobar Islands they comprise 36.85%. The main occupations of the people in the islands include agriculture, animal husbandry, fishing, forestry and plantations, construction, transport and trade.

The indigenous groups are ethnically different tribal communities (Scheduled Tribes[2]) inhabiting the scattered islands of both groups. Today they comprise a very small percentage of the population (about 8.30% as per the 2001 census). Their population has declined considerably over the last 150 years. In all, there are six aboriginal tribes in the Andaman and Nicobar Islands, the two Mongoloid groups, the Nicobarese and the Shompen and inhabit the Nicobar Islands and the remaining four Negrito groups, namely, the Great Andamanese, the Onge, the Jarawa and the Sentinelese and live separate islands in the Andaman group.

The Nicobarese come under the category of the advanced group while the remaining five are categorised as primitive. The Nicobarese practice horticulture by raising coconut plantations and yams. They raise pigs and undertake fishing. The Shompen of the Great Nicobar and the other primitive groups in the Andaman group are mainly hunter-gatherers. Some populations of the Jarawa, the Sentinelese and the Great Andamanese are hostile to outsiders and do not permit landings on their islands.

[1] www.andaman.nic.in

[2] Article 366 of Indian Constitution defines Scheduled Tribes as "such tribes or tribal communities or part of or groups within such tribes or tribal communities as are deemed under Article 342 to be Scheduled Tribes for the purposes of this Constitution". Article 342 specifies that: "(1) The President may with respect to any State of Union Territory, and where it is a State, after consultation with the Governor, by public notification specify the tribes or tribal communities or parts of or groups within tribes or tribal communities which shall for the purposes of this Constitution be deemed to be Scheduled Tribes in relation to that State of Union Territory, as the case may be".

1.1 Geology, Topography and Hydrology

Geologically, the islands are emergent peaks of a submerged mountain chain extending from the Eastern Himalaya to Sumatra. Topographically, the Andaman Islands are characterised by low range of hills and narrow valleys, except in the coastal stretches. The ranges are aligned in a north-south direction, but several spurs and ridges run off the main ranges in all directions. The slopes are moderate to steep, ragged and prone to erosion. Flat lands are comparatively scarce and confined to some of the larger valleys. The highest point in all the areas is "Saddle Peak" on North Andaman Island. It is at an elevation of about 800m above mean sea level. The islands in the Nicobar group are largely flat and gently undulating. Mount Thullier (on Great Nicobar Island) with an elevation of 642 m is the highest peak the Nicobar group of islands.

There is no major perennial fresh water river in these islands except Kalpong in North Andaman, and Alexendra, Dagmar and Galathea rivers in Great Nicobar. There are several rainfed streams that dry up during the summer. The coastline of these islands is wavy with large number of bays, lagoons and serpentine creeks, and extends to 1962 km. At several places tidal creeks penetrate far inside the land and form outlets for fresh water streams.

1.2 Climate and Soil

The Andaman and Nicobar archipelago is situated in the equatorial belt and experiences tropical, warm, moist and equable climate that is greatly influenced by the sea. The temperature ranges from 18° C to 35° C. The proximity of the sea and the abundant rainfall prevents extremes of heat and these islands experience both the northeast and the southwest monsoons. The southwest monsoon commences during April/May and is accompanied by high winds with heavy downpours from June to September. The northeast monsoon usually commences during October and the rains continue through to December. The average annual rainfall ranges from 3,000 to 3,500 mm and humidity varies from 66% to 85%. In some years the islands experience rains during all the months of the year. Cyclones occur during the monsoons, accompanied by very strong winds, particularly during May and November and in some years during mid April. Under normal conditions, the wind speed is fairly constant (5 knots per hour) but during cyclonic weather it may go as high as 120 to 130 knots per hour.

The soil cover is rather thin, varying from 2m to 5m. The coastal flats have an admixture of sand, silty clay and alluvial material with fine fragments of coral lime. The soil is, in general, mild to moderately acidic with high humus on top.

1.3 Landuse Pattern

The Andaman and Nicobar Islands are dominated by forests, which comprise about 87% of the total land area. The WWF eco-region classification divides these forests as the Andaman Islands Rain forests (IM0101) and the Nicobar Islands Rain forests (IM0133)[3]. The main categories of natural vegetation of the Andaman and Nicobar islands are the coastal and mangrove forests and the interior evergreen and deciduous forests. The area under different land use is given in Table 4.

[3] http://www.worldwildlife.org/ - Terrestrial Eco Regions › Indo-Malay › Tropical and Subtropical Moist Broadleaf Forests ›Andaman Islands rain forests (IM0101)/ Nicobar Islands rain forests (IM0133).

Table 4
Land use patterns in the Andaman and Nicobar Islands

Land Use	Andaman		Nicobar		Andaman and Nicobar (combined)	
	Area (km²)	% of total area	Area (km²)	% of total area	Area (km²)	% of total area
Forests (legally notified)						
Reserved	2928.76				2928.76	
Protected	2699.86		1542.07		4241.93	
Total (legally notified)	5628.62	87.84	1542.07	83.76	7170.69	86.93
Total Forest cover (FSI SOF 1999 report)						
Dense(>40% crown density)	4864		1651		6515	
Open (<40% crown density)	90		35		125	
Mangrove Forests	929		37		966	11.71
Total (FSI)	5883	91.81	1723	93.59	7606	92.21
Non-Forest land (Largely Revenue Land) Excluding legally notified forests						
Total Non-Forest	779.38	12.16	298.93	16.24	1078.31	13.07
Urban	16.64	0.26	0.00	0.00	16.64	0.20
Rural	6391.36	99.74	1841.00	100.00	8232.36	99.80
Total land area	6408	100.00	1841	100.00	8249	100.00

Source: Forest Statistics 1999, Andaman and Nicobar Islands, Department of Environment and forests and Basic Statistics, 2002-2003, Directorate of Economics and Statistics, Andaman and Nicobar Administration, Port Blair (www.forest.and.nic.in)

The remaining 13% of land is largely revenue land and is used for human settlements, agriculture and other anthropogenic activities. Most of the revenue land is along coastal areas where the settlements are concentrated. The entire rural and revenue areas are under CRZ IV (Coastal Regulation Zone-category IV), except a very small area under CRZ II. No development is permissible within 200 m of the high tide line in CRZ IV areas (A N D E & F 2001). Of the 13% of revenue land only 21% is under intense cultivation and another 11% is classified as fallow land and cultivable wasteland, plantation crops cover 45% of the revenue land (Sirus 1999, ANET 2003). The total urban are is 16.64 km2. It is worthwhile to mention that most of the human settlements and various anthropogenic activities are mostly concentrated on or towards the eastern coast than on the western. Remedial measures regarding conservation should take this fact in to consideration (WWF 1997).

1.4 Ecosystems – Typology, Status and Threats

Given below are brief descriptions of the various eco-systems present in the islands

1.4.a. Inland forest ecosystem

The inland forest eco-system is characterised by the evergreen and semi-deciduous vegetation types. Vegetation of these islands has been classified into the following twelve forest types by Champion and Seth (1968). However, these forest types are not distinctly demarcated and they imperceptibly merge into one another and form an intimate mixture[4].

1. Giant evergreen forests (1A/C1)
2. Andaman tropical evergreen forests(1A/C2)
3. Southern hilltop evergreen forests(1A/C3)
4. Andaman semi-evergreen forests(2A/C1)
5. Andaman moist deciduous forests(3A/C1)
6. Andaman secondary moist deciduous forests(3A/C1/2S1)
7. Littoral forests(4A/L1)
8. Mangrove (Tidal swamp)forests(4B/TS2)
9. Brackish water mixed forests (4B/TS4)
10. Sub mountain hill valley swamp forests (4C/FS2)
11. Cane brakes (1/E1)
12. Wet bamboo brakes (I/E2)

Of the above, 9 types excepting the Mangrove, Littoral and Brackish water mixed forests, form part

[4] www.forest.and.nic.in , Andaman and Nicobar Islands, Department of Environment and forests.

of the inland forest eco-system.
The Islands still have approximately 86% of original forest cover left, and probably another 10–20% has been degraded by human activities. (MacArthur and Wilson 1967 as quoted by ANET 2003).

1.4.b. Mangrove ecosystem

Mangroves are salt-tolerant forest ecosystems found mainly in tropical and sub-tropical inter-tidal regions of the world. The importance of mangroves cannot be overstated. They support a great diversity of life forms, provide rich feeding and nurturing grounds for many marine species form different tropic levels, including many commercial fish and crustaceans. They also play the important role of sediment repositories, contribute to stabilising shorelines and buffer against storm surges.

The mangrove forests of the islands occupy 966 km2[5] of the total land area of the islands (or about 11.71% of the total land area). These also account for one fifth of the country's total mangroves.

In the Andaman district, area under mangroves is 929 km2, while in Nicobar district mangroves occupy 37 km2. Mangroves occurring in these islands are mostly fringing the creeks, backwaters and muddy shores. Along the creeks, the width ranges from 0.5 km to 1 k m. In certain places, this salt tolerant community is found on rock shores subjected to tidal action and regular deposits of mud. Luxuriant mangroves can be seen in Shoal Bay (South Andaman), Yerrata Jetty in Rangat (Middle Andamans) and in Austin Creek (Mayabunder)[6].

There are 58 mangrove species found in the islands. These include Rhizophora mucronata, R. candelaria, Bruguiera conjugata, B. parviflora, Avicennia sp., Xylocarpus sp., Ceriop tagal, Sonneratia sp., Lumnitzera sp., Kandelia kandel, and Acanthus ilicifolius.

Approximately 253 species of fish, 410 species of polychaetes, and 53 species of meiofauna have been reported to be associated with the mangrove forests in these islands. It is clear that any degradation of coastal ecosystems such as coral reefs and mangroves will have an adverse impact not only on the unique biodiversity of fragile coastal ecosystems but also on coastal fisheries and tourism, which is becoming the mainstay of the island's economy.

Extraction of mangroves for commercial purposes was stopped in 1989 in the islands and most these areas have regenerated to their original form (Andrews 2000 c). However, there are encroachments in some of the areas in North, Middle and South Andamans. There is also some degradation due to fuel wood and pole extraction. Recently, there is also a demand to hand over mangrove areas for shrimp farming, a move that will have harmful environmental consequences as it has in South East Asia and South America. There is also a demand for handing over areas for fattening of mud crabs (ANET 2003).

1.4.c. Coastal ecosystem

Littoral forests and brackish water mixed forests comprise the coastal forest ecosystems. The Littoral forests occur all round the coast wherever a fair width of sandy beach occurs. Manilkara littoralis is the most characteristic species of this type in these islands. Other species include Scaveola frutescens, Hibiscus tiliaceus, Morinda citrifolia, Terminalia catappa, Pandanus tectorius, etc.

The Brackish water mixed forests are considered to be the finest development of tidal forests and may form closed forest of 35 m height. These are found in larger deltas and creeks along the outer periphery and at places where salt water mixes with fresh water. The major species here include Heriteria littoralis, Barringtonia racemosa, B. asiatica, Brownlowia lanceolata, Nypa fruticans, Phoenix paludosa, etc.

1.4.d. Marine and coral reef ecosystem

The coastline of the Islands is 1, 962 km and around 35, 000 km² of continental shelf that provides potential fishing grounds. The 200 miles of Exclusive Economic Zone (EEZ), around the Island group, is vast and covers a sea area of 0. 6 million km2, which is about 30% of the EEZ of India. The marine habitats are quite varied and vast and diverse fauna range from microscopic plankton to whales. Amongst marine animals, the a number of groups are very important. About 70 species of sponges are reported from the Andaman waters and two species are known to be endemic. Over 200 species of corals have been recorded (ANET 2003, WWF 1997).

[5] Source: FSI SOF 1999 report.
The National Biodiversity Strategy Action Plan for Andaman and Nicobar Islands states: "The estimated area of mangroves in 1957 in the islands was about 1200 km2. Another estimate done in 1986/1987 using LANSAT imagery estimated a total of 777 km2 for ANI of which 287 km2 is for the Nicobars. FSI estimates in1999 reported 966 km2. In spite of the discrepancy between the last two figures, it is clear that mangroves have declined by at least 20% over the last 40 years. However, in the last 10 years there has been an increase, with the latest estimate being 1012 km2 (Balakrishnan 1998)".

[6] www.forest.and.nic.in, Andaman and Nicobar Islands, Department of Environment and forests

The Andaman and Nicobar Islands have the last pristine reefs in the Indian Ocean region, and are emerging as one of the most important coral reef sites in the world. Coral reefs stretch over an area of 11,000 km2 in the Andamans while the Nicobars have 2,700 km2 under coral reefs. The Islands have fringing reefs on east coast and a long barrier reef (320 km) along the west. The reefs are poorly known scientifically but may prove to be the most diverse in India and the best preserved. So far 39 genera with more than 200 species of corals have been recorded (of the 76 genera and 342 species found in India). The reefs in the islands stand out when considered vis-à-vis other areas in the region:

1. 117 Species in the Gulf of Mannar and Palk Bay, India
2. 134 Species (65 genera) in Sri Lanka
3. 60 Species (30 genera) from the Mergui Archipelago in Myanmar.

Currently, coral reefs have become globally threatened due to various environmental and climatic factors along with greater use of their resources both directly (e.g. over fishing) and indirectly (e.g. tourism). All scleractinian corals and some associated reef fauna such as sea cucumbers and giant groupers have been brought under the purview of the Wild Life (Protection) Act (WLPA), 1972 under Schedule I. Nine species of molluscs have also been placed in various Schedules of WLPA, 1972.

The coral reefs of the islands are under various degrees of threat such as siltation, sand mining, agricultural runoff and damage due to fishing and tourism activities. These are apart from global climatic factors such as the rise in sea surface temperatures. The collection of shells and sea cucumbers for commercial purposes has led to their drastic decline. While they are protected now, the Department of Environment and Forests has not been given the additional resources necessary to enforce the ban on their collection.

1.4.E. Marine and coral reef ecosystem

Freshwater wetland ecosystems of the islands have at least two restricted range endemic bird species: the Andaman Crake and Andaman Teal (Andrews and Whitaker 1994; Vijayan, 1996 a,b; Vijayan and Sankaran 2000). These ecosystems are also important nesting habitats for the saltwater crocodile. A large number of bat species also occur in this region, many of which are endemic. The swampy areas in lowland evergreen forests have been almost totally destroyed by conversion to agriculture, with the only substantial tracts remaining in Baratang and Little Andaman Islands, and the Jarawa Reserve off the west coast of South and Middle Andaman islands (Andrews and Whitaker 1994; Andrews, 1999, 2000-b, c, 2001, 2002). Little Andaman Island has wetland ecosystems found no were else in the Islands, these include long stretches of freshwater streams, open saline marshes, peat bogs and large tracts of freshwater grassy marshes (Andrews 2000 b; Andrews and Sankaran 2002, ANET 2003).

Open swamps have been drained in a number of places, making these habitats increasingly rare. Demarcating and protecting these becomes a priority task. There are also significant wetlands in revenue areas that need protection. Areas exist in Chouldhari, Bamboo Flat, Sippighat, Wandoor, Baratang, Mayabunder and North Andaman Island.

1.4.F. Agricultural ecosystems

The land that was brought under agriculture by 1981 was 14, 953 ha and by end of 1992 the land under high-yielding varieties of rice was 12, 000 ha. Currently over 53, 315 ha and is under cultivation, of this 27, 890 ha are under coconut and areca nut plantations. This area is decreasing due to urbanisation, industrialisation and the intrusion of seawater.

1.5 Biodiversity and Endemism[7]

The Andaman and Nicobar Islands harbour some of the richest and unique biodiversity in the world. The Islands are an internationally acknowledged hot spot for biodiversity, with over 3,552 species of flowering plants (with 223 endemic species), 5,100 species of animals (100 freshwater, 2,847 terrestrial, 503 endemic) and 4,508 marine species (of which 220 are endemic), 52 species of mammals (with 33 endemics), 244 species of birds (96 endemics) and 111 species of amphibians and reptiles (66 endemic) (Das 1994, 1997a, 1999; Andrews 2001). The islands also have a reported 197 species of corals, with about 80% of the maximum coral diversity found anywhere in the world. This makes them the richest coral reefs in the Indian Ocean and an area of global significance (Turner et al. 2001, Vousden 2001, quoted in Andrews and Sankaran 2002)[8].

[7] http://www.worldwildlife.org/ - Terrestrial Eco Regions › Indo-Malay › Tropical and Subtropical Moist Broadleaf Forests ›Andaman Islands rain forests (IM0101)/ Nicobar Islands rain forests (IM0133).

[8] Dialogue April–June, 2003, Volume 4 No. 4, Conserving the Biodiversity in Andaman and Nicobar Islands, Dr. Vasumathi Sankar, Astha Bharati.

1.6 Flora of the Andaman and Nicobar Islands

Floristically, the Andamans have much more in common with northeast India, Myanmar, and Thailand than with the Nicobars, which have affinities with Malaysia and Indonesia. In fact, the Andamans and Nicobars share only 28 percent of angiosperm species with the Nicobars (Rao 1996). The genera Dipterocarpus and Pterocarpus are common in the Andamans but are absent from the Nicobars. Otanthera, Astronia, Cyrtandra, Stemonurus, Bentinckia, Rhopaloblaste, and Spathoglottis all occur in the Nicobars but not in the Andamans (Balakrishnan 1989; Rao 1996).

The isolation of the Nicobar Islands Rain Forests [IM0133] has given rise to endemic plant and animal species. The rain forests are in good shape and are afforded a high level of protection, but the future biodiversity of the ecoregion is not yet secure. The Nicobars are more similar to Sumatra and Malaysia botanically than to Burma, Thailand, or even the Andamans. The Nicobars contain more than 580 flowering plant species.

Representing 700 genera and belonging to 140 families, about 14% of the angiosperm species are endemic to the islands. Among the non-endemic angiosperms about 40% are not found on mainland India, but have only extra-Indian distribution in South East Asia. (Rao 1996).

1.7 Fauna of the Andaman and Nicobar Islands

The Islands harbour a range of ecosystems from coral reefs, mangroves, sandy beaches to dense forest covered hill slopes and grasslands. The recorded marine biodiversity includes 1200 species of fish, 350 species of echinoderms (sea animals like starfishes, sea urchins, etc.), 1000 species of molluscs (invertebrate sea animals enclosed in shells such as snails shell fish and octopuses) and many more species of lower life forms (ANI F&E 2001).

Overall, 9% of the fauna is endemic. 40% of the 244 species and subspecies of birds are endemic. Mammal endemism is 60% (58 of mammals have been recorded). The Islands supports a significant diversity of reptiles and amphibians along a high level of endemism. Currently 7 amphibians and 16 reptile species are endemic to the Andamans and 2 amphibians and 15 reptiles are endemic to the Nicobars. (Das 1994, 1999; Andrews and Whitaker 1998; Andrews 2001; Andrews and Sankaran 2002). The butterfly diversity and endemism is also very high, of the 214 species and 236 subspecies in 116 genera, over 50% are endemic (Khatri 1993).

1.8 Threats to Biodiversity and Endemism

This endemism is due to the isolation from mainland Asia (Das 1999). Thus, considering the size and area of the islands, loss of habitat leading to extinctions will have far greater consequences in terms of the loss of genetic diversity than comparable areas elsewhere. A rough calculation using island biogeography theory indicates that with the area of forest down to 86% of what it used to be, about 4. 5% of species may have been lost.

Introduced species are a problem in the Andamans. Typical island introductions such as rats, dogs, and cats may be harming the endemic Andaman crake (Rallina canningi) (Stattersfield et al. 1998). Spotted deer (Axis axis) are now widespread throughout the Andamans, as is the African giant snail (Achatina fulica). Elephants (Elephas maximus) have been introduced to Interview Island and North Andaman.
In the Nicobar islands, habitat conversion poses the greatest threat to the ecoregion. Aboriginal peoples have inhabited the Nicobars for at least 2,000 years and are estimated to have converted about 10 percent of the forest cover in that time. Settlement programs brought mainlanders to the Nicobars starting in the late 1960s; they now make up 36 percent of the population. In the past twenty-five years alone, 4 percent of the Nicobars' original forest cover has been lost to mainlanders. The settlement program no longer exists, but the Nicobars are still at a critical juncture where decisions about how to control development and conserve its resources must be made. There are proposals to make the Nicobars a major tourist destination, make Great Nicobar a free trade port, and increase the military presence on the islands. Road development and cash crop promotion (particularly rubber and cashews) are also future threats. Wildlife exploitation threatens the edible-nest swiftlet in the Nicobars, the Nicobar megapode, crocodiles, and sea turtles (Sankaran 1997; Das 1999).

1.9 National Parks and Wildlife Sanctuarie[9]

There are 9 National Parks in the Andaman and Nicobar islands of which 7 are in the Andaman Islands and 2 are in Nicobar Islands. The combined area of

[9] www.forest.and.nic.in , Andaman and Nicobar Islands , Department of Environment and forests

the National Parks is 1153.94 km^2. The total area for the Andamans is 617.70 km^2 and for the Nicobars it is 536.24 km^2. clarify these include marine areas. Table 5 summarises the area covered by different national parks in the region. In all there are 96 Wildlife Sanctuaries in the islands having a total area of 466.218 km^2.

Table 5
The distribution of National Parks in the Andaman and Nicobar islands

S. No.	Name of National Park	District/Division	Area (km^2) check these areas
1.	Mahatma Gandhi Marine National Park	Andaman	281.5
2.	Middle Button	-do-	256.142
3.	Mount Harriet	Andaman	32.536
4.	North Button	-do-	0.44
5.	Rani Jhansi Marine National Park	-do-	0.44
6.	Saddle Peak	-do-	0.03
7.	South Button	-do-	46.62
8.	Campbell Bay National Park	Nicobar	426.23
9.	Galathea National Park	-do-	110
		Total	1153.938

1.10 The Great Nicobar Biosphere Reserve[10]

The Great Nicobar Island is the southern most island of Andaman and Nicobar archipelago and also the southernmost part of India. It lies between 6°45' N and 7°15' N and 93°38' E and 93°55' E, and is about 482 km south of Port Blair. The area is the home of one of the most primitive tribes of India viz., the Shompen. This area is also the habitat of one of the most endangered species viz., Megapode as well as the edible-nest swiftlet (Collocalia fuciphaga). The total geographic area of this island is about 1044 km2. The island presents a varied natural panorama as it is covered with virgin lush evergreen dense tropical forests extending from seacoast to the top of the hills. An area of 885 km2 of this island has been constituted as the Great Nicobar Biosphere Reserve in January 1989 for preserving biological diversity.

[10] www.forest.and.nic.in, Andaman and Nicobar Islands, Department of Environment and Forests.

ANNEXURE 2

TOURISM VISION ANDAMAN AND NICOBAR ADMINISTRATION

Source: http://www.and.nic.in/policy.pdf

Background

The limited scope for Industrial activity in the Islands coupled with the decline in the wood based industry pursuant to the Supreme Court judgment dated 7.5.2002 has led to tourism being identified as a thrust sector for economic development, revenue and employment generation in the islands. Keeping in view the fragile ecology and limited carrying capacity of the islands, the objective of A & N Administration is to strike for sustainable tourism.

The objectives

- To address the growing unemployment problem by placing thrust on promotion of tourism
- Total revenue generation being Rs.84 crores only (2001-2002) the future has to be planned with the objective of higher revenue generation.
- Promoting concepts of eco-tourism
- To encourage private sector in tourism
- To harmonise ecology & tourism for the benefit of the people of the islands

VISION STATEMENT

To develop Andaman and Nicobar Islands as an up market island destination for eco-tourists through environmentally sustainable development of infrastructure without disturbing the natural eco-system with the objective of generating revenue creating more employment opportunities and synergise socio-economic development of the islands.

Vision targets

- Increase the earning from tourism sector
- Achieve the goal of high value low volume eco-tourist inflow.
- Create employment opportunities for at least 1000 persons every year.
- Improve the status/quality of exiting hotels, tour operators and restaurants to the standards set by Govt. of India and UT Administration.
- Discourage un-approved tourism business etc.
- To create awareness and tourism consciousness among the islanders, specially stakeholders
- Creation of adequate infrastructure in close co-ordination with concerned departments to ensure that tourism is sustained by an excellent foundation.
- Preserve the heritage and cultural traits of the islands and enable the development of rural societies.
- Sustainable development of different island destinations
- Preserve the natural eco-system as a treasure

Tourism Policy

The policies and guidelines of Government of India form the basis to promote tourism in Andaman and Nicobar Islands.

The Administration is focusing on the following issues: -

- Promotion of high value low volume eco-friendly and environmentally sustainable tourism.
- Undertaking tourism activities, which are not harmful to the eco-system
- To implement the master plan proposed by UNDP/WTO report for sustainable development of tourism in Andamans.
- Playing the role of a facilitator and encouraging private sector investment in development of tourism infrastructure.
- Gradual privatization of management of existing tourism infrastructure
- Development of new tourism activities/products
- Marketing A& N Islands as tourist destination at national and international level

Action Plan

Priorities for 2003-2007

- Implementation of UNDP/WTO recommendations
- Facilitate landing of international flights at Port Blair
- Attract private investment for development of high quality eco-tourist resorts and water sports/scuba dive centres/game fishing centres.
- Obtain relaxation in Coastal Regulation Zone (CRZ) and environmental guidelines.
- Obtain environmental clearance for projects on forest land.
- Easen Restricted Area Permit (RAP) rules or facilitate long term RAP for foreign investors.
- Open more islands for tourism
- Sound and Light show at Viper Island
- Utilization of Exhibition complex for other promotional fairs and events
- Assume the role of facilitator and lease out the built up infrastructure of the Directorate for professional management by private sector
- More thrust to marketing – by starting proper advertisement campaign with the help of empanelled professional advertising agencies
- Participate in more international exhibition/buyer seller meet
- Organise more travel marts in the Andamans with wider & sponsored participation.
- Define the tourism policy of the islands and give wide publicity to the same.
- Formulate Tourist Trade Regulation for the islands and

introduce registration system for all tourism related activities.
- Create a data bank of tourism related activities
- Introduce high quality inter islands tourist cruise vessels (initially in Government sector).
- Opening of more Sanctuaries/ National Park for promoting eco-tourism or nature tourism
- Training for hospitality staff in Government as well as private sector
- Awareness programme for islanders
- Promote eco-friendly practices in tourism sector
- Initial steps for introduction of tourism in Nicobar group of islands
- Planned development of capital area
- Study for integrated development of Havelock and Neil Islands
- Incentives for introducing water harvesting, solid/ liquid waste management systems, captive power generation, recycling waste water and adopting eco-friendly practices
- Incentives for using non-conventional energy sources
- Introduce eco-friendly practices and awards
- Promoting environment friendly building guidelines
- Popularize Monsoon Tourism
- Make Island Tourism Festival more attractive by diversifying programmes
- Promote face lift to Port Blair by adding greenery (continuing programme)
- Periodical market research by professional agencies to identify the target group/market (continuing programme)
- Development of way side amenities
- Attract private airlines and charter flights specially from S.E.Asia
- Get one golf course-cum-resort developed in private sector at Port Blair
- Develop infrastructure for tourism in Nicobar group with the help of Tribal Council/Society
- Floating Cottages on creeks at Mayabunder area, Elphinston Harbour (Rangat) area
- Get at least 3 high quality resorts developed in private sector (North Passage Island, Long Island & Smith Island).

Priorities for 2008-2012

- Get one convention centre developed in private sector
- Develop state of the art Marina with facilities for yachts at Port Blair
- Develop facilities for a terminal for cruise liners at Port Blair
- More focused, marketing aimed at target groups
- Carry out study by highly professional agencies, preferably by UNDP as a continuation to their earlier study to assess the status of tourism sector and to evolve strategies for future.
- Integrated Development of Little Andaman Island
- Dedicated medium range cruise vessel for plying in Andaman and Nicobar Islands
- Terminals for cruise liners/yachts at all popular islands from Diglipur to Campbell Bay
- Wave surfing facilities at Butler Bay
- Construction of eco-friendly semi-permanent jetties at popular destinations
- Undertake separate (island specific) studies for integrated development of different island destinations
- Development of tourism infrastructure in Baratang Island
- Water sports complex at Havelock
- Full fledged tourist facilitation centre for booking of accommodation, inter islands tickets at Port Blair
- Multiplex and facilities for evening recreation at Port Blair
- Declaring no-plastic zones
- Professionalising the entire functions of Directorate of Tourism (Continuing programme)
- Introduction of Health Resorts
- Popularize Andamans as a destination for business meetings/conference etc.
- Introduce insurance cover to tourists
- Deploy lifeguards at all beaches
- Introduction of helitourism
- Establish unit of Institute of Hotel Management and Catering Technology (Ministry of Tourism) in Andamans.

Priorities for 2013-2017

- Integrated Development of Nicobar group of islands
- Glass bottom submarine in Mahatma Gandhi Marine National Park
- Dolphinarium at Chidyatapu
- Cable car
- State of the art adventure water sports complex at Port Blair
- Integrated development of Rutland Island
- Multi entry/exit points instead of one (Port Blair) at various places
- Water theme park at Gandhi Park.

Priorities for 2018-2022

- Integrated Development of Campbell Bay
- Sea World (under sea aquarium) at Chidyatapu
- Water sports complex at Mayabunder
- Water sports complex at Diglipur.

Priorities for 2023-2027

- Periodical studies by professional agencies to assess the performance of the tourism sector to find the strengths and weaknesses and to evolve strategies for future. (continuing programme)
- Airstrips at Havelock, Long Island, Diglipur and Little Andaman
- Inter island sea plane services.

ANNEXURE 3

BACKGROUND NOTE ON DEVELOPMENTAL ACTIVITIES IN THE ANDAMAN AND NICOBAR ISLANDS[1]

1. Tourism: A Vision for the Andaman and Nicobar Islands

There is a limited scope for promotion of industrial activities in the islands, due to the non –availability of local raw materials, skilled manpower and ready markets. The wood based industry, which was providing some direct and indirect employment is also on the decline due to environmental considerations. Considering the natural and virgin beauty of the Islands, economic development and employment generation in the islands by way of development of tourism can change the economic scenario in the islands and bring about significant
changes in the living standards of the local population.

The islands are endowed with vast tropical rain forests, beautiful beaches, meandering creeks, lush flora, rare fauna, rich marine life and corals. The islands also have historical sites such as the Cellular Jail where a number of freedom fighters were incarcerated during the struggle for independence. The un-explored Andaman and Nicobar Islands virtually represents the final frontier of tourism. In view of the fragile ecology and limited carrying capacity of the islands, the Andaman and Nicobar Administration is endeavouring to strike a healthy balance between zealous over-protection and callous over-exploitation with the objective of a harmonious convergence of the environment with tourism. Table 6 outlines the outlay and expenditure on tourism during the 9th Five Year Plan.

Table 6
Outlay and expenditure for tourism during 9th Five Year plan

Period	Outlay (in lakhs of rupees)	Expenditure (in lakhs of rupees)	% Achievement
Annual Plan 1997–1998	650	582.73	89.65
Annual plan 1998–1999	700	775.36	110.76
Annual plan 1999–2000	650	666.34	102.51
Annual plan 2000–2001	684	682.27	99.74
Annual plan 2001–2002	722.61	713.44	109.89

[1] Source: Parliamentary Standing Committee on Home Affairs, "Background Note on Developmental Activities in the Andaman and Nicobar Islands", Vol. 1, June 2005.

2. Scrutiny of the 9th Five Year Plan Schemes

The 9th Five year plan in Tourism Sector had 8 schemes:

1. Construction of tourism accommodation
2. Publicity and propagation of tourism
3. Development of recreational tourism and water sports
4. Development of tourism spots
5. Strengthening of the Directorate of Tourism
6. Setting up of a marine aquarium /dolphinarium
7. Establish an Andaman and Nicobar Tourism Development Authority
8. Ancillary services in the Tourism industry and setting up of a new polytechnic.

After scrutiny and review, the Working Group decided to drop scheme numbers 6, 7 and 8. The Working Group felt that in case it is decided to establish a dolphinarium, etc. they can be covered under scheme no.3. Similarly, scheme no.8 is not required as the hospitality sector courses are being run by the Government Polytechnic as well as the Jawaharlal Nehru Rajkeeya Mahavidyalya. It was also felt that there is no need to establish a separate Tourism Development Authority in the islands at present.

2.1 Objectives of the 10th Five Year Plan

Promotion of eco-friendly and environmentally sustainable tourism.

1. Facilitate and encourage private sector investment in various sectors like development of high quality resorts, introduction of high speed boats, adventure water sports, etc.
2. Continuing to simultaneously concentrate on the development of new tourism activities /products
3. Marketing the Islands as an eco-tourism destination

The following are the schemes selected under the 10th Five Year Plan

1. Construction of tourist accommodation
2. Propagation and publicity for tourism
3. Development of recreational tourism and water sports.
4. Development of tourism spots.
5. Strengthening the Directorate of Tourism
6. Incentives to the tourism industry
7. Faster inter islands transport service for tourists

On the basis of the zero based budget, schemes 6 and 7 have been omitted as the Department of Industries had formulated the same schemes. Further, schemes 3 and 4 have been merged with scheme 2 and re-named accordingly.

The schemes are:

1. Strengthening the Directorate of Tourism
2. Creation and maintenance of tourism infrastructure
3. Tourism promotional activities
4. Strengthening and maintaining tourism accommodation

Table 7
Outlay and expenditure for tourism during the 10th Five Year plan

Period	Outlay (in lakhs of rupees)	Expenditure (in lakhs of rupees)	% Achievement
2002–2003	750.00	794.63	105.95
2003–2004	600.00	649.00	108.16
2004–2005	637.00	584.35	91.73
2005–2006	822.00	-	-

2.2 Schemes Under the Five Year Plans

Scheme No. I:
Strengthening of the Directorate of Tourism

This Scheme broadly provides for planning and administration of tourism activities as well as development of human resource by providing training to be imparted by experts for various skills related to tourism. This scheme also provides for preparation and updating statistical information on tourism. An amount of Rs. 43 lakhs has been proposed for the purpose.

Scheme No. II:
Creation and maintenance of tourism infrastructure

The scheme also envisages the upgradation and modernisation of existing infrastructure. To provide entertainment and to attract tourists to various locations, the development and beautification of various tourists' spots is imperative. For this, the construction of roads, additional amenities, restoration of monuments, creation and upgradation of infrastructure of civil, electrical facilities, etc. is undertaken. The maintenance of beaches and environmental improvement activities are also undertaken. Further, other entertainment activities like water sports are provided. This scheme also provides for undertaking and creating new activities like a golf course, glass bottom boat, sound and light show, etc. An amount of Rs. 288.00 lakhs has been proposed. There would be direct and indirect employment generation for about 5000 persons by this scheme.

Some of the activities to be undertaken are:

1. Construction of a road to the waterfall at Little Andaman
2. Developments of roads near tourist spots
3. Setting up of a sound and light show at Viper Island, construction of a toilet block, construction of a fast food centre, renovation of the sea wall, construction of a Type 1 quarter for the watch and ward staff, construction of a pathway, etc.
4. Restoration of the Ross Island monuments and the repair of damage sea walls, etc.
5. Development of the Humfregunj Memorial
6. Development of way side amenities
7. Up gradation of infrastructure for the water sports complex at Diglipur
8. Repair and maintenance of existing water sports complex at Aberdeen

Scheme No. III:
Tourism promotional activities

For the promotion of tourism, publicity and marketing activities are required. Andaman Tourism is to start various schemes to attract low to high end tourists from India as well as abroad. This is a popular eco tourism destination and in order to inform potential tourists regarding the pros and cons of various destinations, information dissemination and publicity is undertaken by means of visual and print media, as well as organising road shows. Advertisements and write ups are given to various newspapers, magazine etc. The Department also organises the Island Tourism Festival at Port Blair and also participles in the India International Trade Fair at Pragathi Maidan. The Department maintains tourist information bureaus at Delhi , Chennai and Kolkatta, Port Blair airport and at the Directorate of Information, Publicity and Tourism. Tourist information in the form of booklets and brochures prepared by the department are provided to the tourists. Tourist vehicles are purchased and maintained by the Department. An amount of Rs.316.00 lakhs has been proposed for this purpose.

Scheme No. IV:
Strengthening and maintaining tourist accommodation

For the convenience of tourists, accommodation and infrastructure facilities are required. The department has constructed tourist guest houses at Port Blair, Havelock, Neil Island, Rangat, Mayabunder and Diglipur. These guest houses are also provided with electricity and water connections, generator sets, telephone lines, kitchens, other furnishing and housekeeping
facilities. The Department undertakes the creation of guest houses, as well as the maintenance and recruitment of staff for these establishments. The Department is also exploring the possibilities of a tourist boat house .About 5000 persons would be employed directly or indirectly by this scheme. An amount of Rs.175.00 lakhs has been proposed for this purpose.

2.3 Sub-sector: Information and Publicity

The publicity department informs the citizens of activities, schemes and programmes of the government. The information is disseminated through visual and print media, and the screening of various films and photo shows are organised at various locations in the Islands. Television and Dish Antennae are also provided in remote areas for easy access to information. Books, periodicals and journals are also provided at various news and information centres. Moreover, the residents of the Andaman and Nicobar Islands are also taken on educational tours for Bharat Dharshan with a view to familiarise them about self-employment and economic activities being undertaken by various institutions, NGO, etc. on the mainland.

In order to promote the information and publicity activities of the government, various activities are undertaken like organising film festivals, the purchase and maintenance of televisions and video cassette and DVD players, multi media projectors, books and periodicals, journals, the creation and maintenance of art units, film projects, printing of calendars and diaries, participation in the India International Trade Fair, New Delhi and participation in the Republic functions and so on. The outlay and expenditure for information dissemination and publicity during the 9th Five Year Plan is summarised in Table 8.

Table 8
Outlay and expenditure for publicity during the 9th Five Year plan

Period	Outlay (in lakhs of rupees)	Expenditure (in lakhs of rupees)	% Achievement
Annual Plan 1997–1998	92.000	119.260	129.63
Annual plan 1998–1999	103.000	103.760	100.73
Annual plan 1999–2000	75.000	67.950	90.60
Annual plan 2000–2001	66.000	63.970	96.920
Annual plan 2001–2002	75.000	71.530	95.370

During the 10th plan an outlay of RS. 330 lakhs has been earmarked. The following schemes were proposed in the 10th Five Year plan under the information and publicity sector:

1. Dissemination of information.
2. Development of audio-visual and other publicity material.
3. Organisation of the Bharat Darshan tour
4. Strengthening of the Information and Publicity Wing.
5. Image building of the Andaman and Nicobar Islands at national and international level through various media.

On the basis of the zero based budget during 2004-05 schemes 1, 3 and 5 were merged with scheme 3 and renamed accordingly. Theses scheme are:

1. Strengthening of the Information and Publicity Wing.
2. Creation and maintenance of publicity infrastructure/equipment.
3. Information on promotional activities.

Table 9
Outlay and expenditure for publicity during the 10th Five Year plan

Period	Outlay (in lakhs of rupees)	Expenditure (in lakhs of rupees)	% Achievement
2002–2003	67.00	64.50	96.26%
2003–2004	60.00	68.74	114.56%
2004–2005	68.74	66.02	101%
2005–2006	66.02	-	-

3. Impact of the Tsunami

On 26th December, 2004, a massive earthquake measuring 9.3 on the Richter scale, was recorded in the Indian Ocean, in a region very close to the Islands. The earthquake (which is believed to be the second largest recorded quake in history) was followed by a killer tsunami, which unleashed havoc and devastation causing huge damages to life and property in the Islands. Estimated of damages to tourism properties, assets and infrastructure of the Andaman and Nicobar Administration are summarised in Table 10.

Table 10
Financial estimates of loss of tourism properties and infrastructure as a result of the earthquake and tsunami of 26th December 2004 in the Andaman and Nicobar Islands

Sl. No.	Name of Islands/ Assets	Approximate Cost (in lakhs of rupees)
1.	North & Middle Andaman	
	a. Turtle Resorts, Diglipur	4.00
	b. Hawksbill Nest, Rangat	1.00
2.	South Andaman	
	a. Repair of Directorate of IP & T Building	15.00
	b. Repair of Andaman Teal House at Port Blair	4.00
	c. Repair of Hawksbill Nest, Neil Island	4.00
	d. Dolphin Resort, Havelock (Construction of sea wall, reconstruction of footpath and 60 m compound wall)	25.00
3.	Machinery and Equipment	5.00
	a. Dolphin Resort, Havelock	5.00
	b. Gandhi Park, Port Blair	47.00
	c. Addition, replacement, maintenance, up gradation of rides of Amusement Park , Port Blair	87.50
	d. Procurement/maintenance and operation of boasts, out board motors, water scooter, jet ski, and other sporting equipments at Andaman Water Sports Complex, Port Blair	60.00
	e. Sound and light show at Viper Island	4.00
	f. Film Unit, Directorate of IP & T.	
	Total	261.50

Tourism, which was the lifeline of the Island's economy has been adversely affected by the disaster. On 26th December 4000 tourists were at the various tourist destinations in the islands. They were all airlifted within 4 days to the mainland. But the scars of the disaster continue to remain in the minds of the national and international tourists, and as such tourist arrivals have dipped to rock bottom levels.

This has led to meagre business for travel agents, tour operators and hotels in the Islands, which in turn is affecting livelihoods. The Andaman Water sports Complex owned by the Directorate of Information, Publicity and Tourism of the Andaman and Nicobar Administration has been destroyed along with the boating facilities. One of the prime tourist attractions, the Jolly Buoy Island has been devastated by the waves and is now closed for tourism. The road leading to the famous beach of port Blair – the Corbyn's Cove beach is in a dilapidated condition and is awaiting repair. All the guest houses owned by the Directorate of Information, Publicity and Tourism

have developed cracks and requires urgent overhaul. The private sector has also reported damage to the tourism property and assets as well as revenue loss. In addition to the above mentioned material affects of the Tsunami, the adverse publicity generated by the negative media reports in television channels and print media has created a fear psychosis among the potential tourists, as a result of which they are avoiding visits to the Islands. The tourist inflow for the last five years and the post tsunami period is summarised in Table 11.

The Andamans was the only place where not a single tourist was reported to have died or injured due to the earthquake and the tsunami. Most of the tourist destinations of the islands were not affected by the killer waves and therefore are safe for tourism. However, infrastructure such as jetties, roads, shipping services, communication links and aviation services were damaged which in turn affected the tourism business. Hence the Administration needs support for reconstruction.

Table 11
Tourist inflow into the Andaman and Nicobar Islands in the past five years and in the months following the tsunami

Year	Domestic tourists	Foreign tourists	Total
2000	81432	4684	86116
2001	85866	5249	91115
2002	90629	4707	95336
2003	93899	4281	98180
2004	105004	4578	109582

comparision of pre and Post Tsunami tourist traffic

Year	Domestic tourists	Foreign tourists	Total
Jan-04	12498	811	13309
Jan-05	1166	169	1335
Feb-04	11167	844	12011
Feb-05	1122	191	1313

4 Strategy for Tourism Development Post-Tsunami

4.1 Short-term objectives

About 1 lakh tourists visit the Andamans every year. More than 95% tourists are Indian, and the remaining are foreigners. After the earthquake and tsunami of 26th December, 2004, the arrival of tourist has dropped. Tourism was one of the major sectors contributing to the economy of the islands and was responsible for employment generation on a large-scale. For the revival and promotion of tourism, a list of demands for developmental assistance have been taken up with the Government of India, through the Planning Department of the Andaman and Nicobar Administration. These are:

1. Creation of marinas at Port Blair, Mayabunder, Diglipur and in the Nicobar District to facilitate the berthing of large cruise liners and large ships for promotion of tourism and also for undertaking research and scientific work.
2. Introduction of two cruise liners from Chennai Kolkatta to Port Blair.
3. Introduction of four ships exclusively for tourists form Chennai, Kolkatta and Vishakapatnam to port Blair with three–five star facilities.
4. Ten helicopters for transportation of tourists between different islands.
5. Four sea planes for transportation of tourists between different islands.
6. Five hovercrafts for transportation of tourists between different islands.
7. Four catamarans for transportation of tourist between different Islands.
8. Ten high–speed luxury ships (35 knots) having three-five star quality service for transportation of tourists between different islands.
9. Four mechanised yachts for high end tourist for

inter island or pleasure transportation.

10. Creation of water sport complexes at Port Blair, Havelock Island and Mayabunder, Diglipur and Little Andaman along with storage facilities, changing rooms, etc. Additional facilities like eating joints and shopping facilities can be included.
11. Water sporting boats, equipments and accessories that are required include:

(a) Four speed boats – 250 Hp.
(b) Four speed boats – 120 Hp.
(c) Four speed boats – 90 Hp.
(d) Four speed boats – 70 Hp.
(e) Four speed boats – 40Hp.
(f) Six speed boats –25 Hp.
(g) Six glass bottom boats – 25 Hp.
(h) Eight water scooters – 15 Hp.
(i) Ten jet skis
(j) Ten Gemini Boats
(k) Ten sail boats
(l) Twenty wind surfing boards
(m) Five wave surfing boards
(n) Twenty five water skis with accessories
(o) Four para sails with accessories
(p) Seventy life buoys
(q) Hundred lifejackets
(r) One hundred and twenty five oars
(s) Four swamp boats (air boats)
(t) Ten dive boats
(u) Twenty scuba diving sets with accessories
(v) Four underwater still cameras
(w) Four open video cameras
(x) Four open ferry boats
(y) Four jet boats
(z) Six pilot boats
(aa) Twenty sitting tubes
(bb) Twenty banana rides
(cc) Hundred high quality snorkels
(dd) Five inflatable jetties
(ee) Fifty inflatable jetties
(ff) Twenty inflatable boats of 10 Hp.
(gg) En static VHF/UHF wireless sets.
(hh) Forty VHF/UHF Wireless Handsets
(ii) Ten water cycles – single
(jj) Ten water cycles – double

12. Luxury tents for camping at island destinations (50).
13. VIP tents for camping at islands destinations.
14. Sun loungers (50) and bathrobes (150).
15. Hammocks (50).
16. Fifty beach umbrellas with tables, chairs and accessories.
17. Musical fountain at Port Blair and Diglipur.
18. Golf course at Port Blair.
19. Two multiplexes with shopping malls and amusement parks at Port Blair and Diglipur.
20. Five static balloons.
21. Eight plasma/projection televisions.
22. Six high quality digital cameras of 8.1 Mega pixels with 10 X zoom for photographs for tourism promotions.
23. Six optical cameras (High end).
24. Two digital video cameras (High end).
25. Four plasma display panels.
26. Cable Car connection at Port Blair.
27. Four tourist submarines.
28. Production of two high quality tourism promotion films by professional agencies.
29. Media campaign by the Government of India, Ministry of Tourism for promotion of Andaman tourism.
30. Free space in the India pavilion for tourism exhibitions abroad along with free travel, lodging, boarding and transportation of officers of the Andaman Tourism department.
31. Scientific waste disposals at various units.

4.2 Medium-term objectives

i) Introduction of direct flights from Delhi, Mumbai, Cochin and other important destinations of the country to Port Blair. (At present flights to Port Blair operate from Kolkata and Chennai only).
ii) Introduction of flights by various airlines to port Blair such as Sahara, Air Deccan, Kingfisher, etc. and also private chartered flights. (At present only Indian Airlines and Jet Airways operate fights to Port Blair).
iii) Introduction of competitive and attractive airfares by various airlines (including Apex, Super Apex, Metro Apex fares). (Most of the tourist decisions to travel to various destinations in the country and abroad are primarily determined by low airfares).
iv) Introduction of flights to Port Blair by international airlines.
v) Introduction of international charted Flights to Port Blair. (Charted flights occasionally do arrive at Port Blair. This requires to be promoted).
vi) Declaring Port Blair Airport as an international airport.
vii) Transfer of the operations of the airport to the Airport Authority of India. (At present the operation are with the defence authorities. Difficulties are experienced in operating flights beyond the afternoon due to want of clearance from the Air Traffic Control. However, the air force

does operate its flights in the afternoon).

viii) Opening of additional civilian airports in the Andaman as well as Nicobar Districts for landing of national and international flights as well as for operation of helicopter services and small planes for inter island transportation.
ix) Introduction and promotion of sea planes for national and international transportation.
x) Introduction of helicopter services, small planes and sea planes by the government as well as by the private sector for inter island transportation of tourists.

4.2.2 Issues related to connecting Port Blair by sea

i) Creation of marinas at port Blair, Mayabunder, Diglipur and in the Nicobar District to facilitate the berthing of large cruise liners, large ships for promotion of tourism and also for undertaking research and scientific work.
ii) Providing more number of quality jetties, with quality tourist facilities like eating joints, shopping facilities, waiting terminals/halls etc. in South Andaman, Middle Andaman , North Andamans and the Nicobar District.
iii) Introduction of high quality ships with large , medium and small capacities, cruise liners and catamarans for transportation of tourists from the mainland as well as other countries.
iv) Introduction of online booking facilities for ship tickets from major cities of the country as is available in the case of the railways.
v) Introduction of hovercrafts, catamarans, luxury boats and yachts for faster transportation of tourists between various tourist locations in the Andaman and Nicobar Islands.

4.2.3 Tourist accommodation and infrastructure

i) Promotion of quality resorts, hotels and restaurants preferably by the private sector. For this purpose, more islands having tourism attractions need to be opened for investment by the private sector. Road and wayside tourist amenities like changing rooms, toilets, eating joints, motels and rest rooms need to be introduced by way of the build-operate-maintain concept by the private sector. Where the private sector is not forthcoming, Government of India, Andaman and Nicobar Administration, ITDC or other public sector undertakings could be involved.
ii) Introduction of shopping multiplexes and entertainment and amusement parks.
iii) Creation of quality fly-overs.
iv) Introduction of quality road transportation vehicles by private or Govt. sector. Eco- Friendly modes of transportation like solar powered vehicles, electricity operated vehicles, etc. can also be considered.

4.2.4 Important tourist attractions

i) Introduction and promotion of quality water sporting activities including adventure water sporting. For this, water sporting complexes need to provided at various islands which are having tourist potential. Quality boats, equipment and material for water sporting activities also need to be provided. Qualified manpower, life guards etc. is required. Introduction of sailboats, wind surfing, wave surfing, para sailing, speed boats, jet skiing, water skiing , glass bottom boats, Geminis, static balloons, etc. are some of the possibilities.
ii) Promotion of scuba diving and snorkelling activities.
iii) Introduction of cable car.
iv) Tourism submarine.
v) Feasibility of creating a hanging bridge as tourist attraction.

4.2.5 Other Matters

i) Promotion of the Andaman as eco-tourist destinations at the national as well a international level by the Ministry of Tourism, Govt. of India in various media.
ii) Production of high quality films and CDs on the Andaman's tourism potential by agencies of the Ministry of Tourism, Govt. of India.
iii) Free travel, lodging, boarding facilities for participation in the India pavilion in international exhibitions to the officers of Andaman Tourism.
iv) Easy tourism visa facilities.
v) Facilities of long term Restricted Area permits for persons associated with the tourism sector.

ANNEXURE 4

A comparison of two Sustainable Tourism Development Plans for Andaman & Nicobar Islands

SL No.	Parameters of Sustainable Plans	Sustainable Tourism Development Plans for Andaman and Nicobar Islands (UNDP, WTO)	Perspective Plan for Tourism in Andaman and Nicobar Islands (A.F. Ferguson and Co)
1	Analysis of Existing Environmental and Socio economic characteristics		
A	Review of policies, plans and studies	WTO UNDP plan has captured most of the previous plans and studies done for tourism development in Andamans There is substantial analysis of environmental policies and legislations of India as applicable to the Islands	Not much analysis of previous policies and plans has been made.
B	Economic Review of Islands	Plan makes an attempt to analyse different sectors of economy. However 3 chapters have been devoted entirely to the discussion on tourism, other sectors/ livelihood options (esp fishing, agriculture, forestry) do not get much attention . Andaman's tourism potential compared with Maldives, Seychelles and Mauritius	Substantial details on contribution of sectors have been provided Reference to small island economies has also been provided. Substantial discussion has gone into outlining tourism potentials of the Islands. Assessment of Infrastructure: water, power, transportation get an important place in the report.
C	Socio Cultural analysis	At length discussion on historical and cultural heritage, however concern to indigenous people completely bypassed No socio cultural impact of tourism has been assessed with the assumption that Andman is a cosmopolitan place having most of the migrant population	Focus is more on population growth and other demographic details. Discussion on cultural aspects, inter community dynamics and concern of indigenous people is not adequate. Although plan recognises isolation of .
D	Environmental Analysis	Report recognises some threats to environment however very little analyses has gone to this. In fact report also negates any serious environmental degradation caused by tourism in Andamans.	Analysis of environmental legislation has been done. In addition assessment of air environment, water environment, forests, mangroves and coral in Islands has also been done. Basic infrastructure bottlenecks and fragile ecosystems considered as weakness for tourism development

2.	Spatial Development Strategy	Plan attempts zoning without any strong environmental, social or economic rationale to it. Instead zonal classification is based on attractiveness of the beaches, coral reefs, cultural heritage and national parks. This attractiveness is also defined from a very subjective point of view.	No specific spatial development strategy suggested, though there is at length discussion on tourism potentials of different islands and places. The plan however also talks about entry point and movement analysis of the various tourism potential areas.
3.	Market Development	Ample attention has gone into this. Aggressive promotion suggested in Europe, America and South East Asian markets specially in Singapore and Thailand. Emphasis is on High value tourism	No adequate analysis on this
4.	Tourist facilities and Accommodation	Plan suggests building of resorts in hilly and forested areas closer to the sea. Number of such resorts not mentioned, though bed capacity suggested is between 80 to 200. Water sports, forest camps are other major proposals.	Role of private sector in developing facilities has been emphasized
5.	Transportation Facilities	Aggressive plans for Airport extension, modernization, opening of new terminals and inter island air transportation. Plan also suggests extension of services to Hong Kong, Phuket, Kualalampur and Singapore . Port facilities, ferry services ad road transportation are other suggestions	No adequate analysis on this
6.	Human Resource Development	Employment ratios are calculated, without any emphasis on local employment generation Plan recognises that existing people do not have skill and sophistication to handle " foreign tourists". Therefore, suggests to open Hotel Management Institute	Inadequate analysis in this context
7.	Environmental strategy	Carrying capacity analysis reflects 450 beds/ hectare of beach. Dispersing the tourist throughout the islands and bringing more areas into tourism has been core strategy to protect the environment.	Plan reflects the concerns to protect the environment. However no clear strategy has emerged.
8.	Institutional and Policy Matters	CRZ considered as critical constraint, which precludes the effective development of the most important tourism asset. Private sector participation and tax concessions. Ending of regulatory and bureaucratic procedures	Stringent environmental legislations, tribal protection, limited access, security restriction and regulatory measures considered as constraints of tourism development. Greater emphasis is laid on Private sector participation. The rationale for PPP is to promote high value tourism. PPP case studies of China, Thailand, Kerala and Karnataka are highlighted

BIBLIOGRAPHY

1. Andaman and Nicobar Administration, August 2005. "Andaman and Nicobar Islands Through Tsunami- A saga of courage", Port Blair.

2. Department of Environment and Forests, Andaman and Nicobar Administration, ,2003. "Working plan of South Andaman forest division (For the period from 2003 to 2013)", Port Blair.

3. Department of Environment and Forests, Andaman and Nicobar Administration, ,2003. "Working plan of Middle Andaman forest division (For the period from 2003 to 2013)", Port Blair.

4. Parliamentary Standing Committee on Home Affairs, June 2005. "Background Note on Developmental Activities in ANI, Volume –I, Port Blair.

5. Ministry of Environment & Forests, October 2003. "Integrated Coastal Zone Management (ICZMP) Plan Preparation for Selected Islands of Andaman, Executive Summary (Draft) prepared by Institute of Ocean Management, Anna University, Chennai.

6. Ministry of Environment & Forests, February 2005. "Report of the Committee, Chaired by Prof. M.S. Swaminathan to Review the CRZ Notification 1991", New Delhi.

7. Directorate of Census Operations, 2001. "Census of India 2001 - Andaman and Nicobar Islands A to Z for Housing Census, Summary Results on Houses, Households Amenities and Assets", Port Blair.

8. Directorate of Economics and Statistics, Andaman and Nicobar Administration, 2001. "Island wise Statistical Outline 2001", Port Blair.

9. National Environmental Engineering Research Institute, October 2000. "Carrying Capacity based Development Planning for Implementation of Master Tourism Plan in Andaman Islands", Nagpur.

10. Andrews, H.V. & Vaughan, A., May 2005. "Ecological Impact Assessment In The Andaman Islands, Including Observations In The Nicobar Islands- Post 2004 Tsunami", Wildlife Trust of India, New Delhi.

11. Ali, R. 2005. Comments on the draft State Development Report (Sept 2005). FERAL, Pondicherry.

12. Andrews, H.V. 1999. Status of saltwater crocodile in the Andaman Archipelago. Envis: Wildlife and protected Areas. Bi-annual Bulletin, Wildlife Institute of India. 2(1):38–43.

13. Andrews, H.V. 2000a. Impact assessment of the little known Little Andaman Island, Andaman, India Newsl. of the Irula Women's Welfare Society 12(2):52–83.

14. Andrews, H.V. 2000b. Current marine turtle situation in the Andaman and Nicobar Islands- An urgent need for conservation action. Kachhapa 3:19–23.

15. Andrews, H.V. 2001. Threatened Herpetofauna of the Andaman and Nicobar Islands. In: An Overview of the Threatened Herpetofauna of South Asia. (eds. C.N. B Bambaradeniya and V. N. Samarasekara), pp. 39–47. IUCN, Sri Lanka and Asia Regional Biodiversity Programme, Colombo, Sri Lanka.

16. Andrews, H.V. 2002. Impact Assessment Around the Jarawa Reserve, Middle and South Andaman Islands. In: Jarawa Contact-Ours with Them, Theirs with Us. (eds. K. Mukhopadhyay, R. K. Bhattacharya and B. N. Sarkar), pp. 73–109. Anthropological Survey of India, 27 Jawaharlal Nehru Road, Kolkata, 700 016, India.

17. Andrews, H.V. and A. Vaughan 2005. Ecological Impact Assessment. In: The Andaman Islands, Including Observations In The Nicobar Islands- Post 2004 Tsunami. ANET, May 2005 for the Wildlife Trust of India.

18. Andrews, H.V. and R.E Whittaker. 1994. Status of saltwater crocodile (Crocodylus porosus, Schneider, 1801) in North Andaman Islands. Hamadryad. 19: 79-92.

19. Andrews, H.V. and V. Sankaran (eds.). 2002. Sustainable management of protected areas in the Andaman and Nicobar Islands. ANET, IIPA and FFI, New Delhi.

20. Andaman Nicobar Environmental Team (ANET).

2003. Andaman and Nicobar Islands Union Territory Biodiversity Strategy and Action Plan (draft).

21. ANI Administration. 2005 a. Background Note on Developmental activities in ANI, June 2005 for the Parliamentary Standing Committee on Home Affairs, Volume – I, ANI Administration

22. ANI Administration. 2005 b. ANI Administration 2005 b. Section 12 Fisheries, Background Note on Developmental activities in ANI, June 2005 for the Parliamentary Standing Committee on Home Affairs, Volume I, ANI Administration.

23. Arthur, R. 2005. Killing the Goose and Eating it Too: Mixing Developmental Metaphors in the Andaman and Nicobar Islands. Comments on the draft Andaman and Nicobar State Development Report 2005. Nature Conservation Foundation, Mysore.

24. Biguglio, L. 1999. Small Islands, Measuring vulnerability. Available at: http://www.ourplanet.com.

25. Champion, H.G., and Seth, S.K. 1968. A Revised Survey of the Forest Types of India. Government of India Press.

26. Das, I. 1994. A check-list of the amphibians and reptiles of Andaman and Nicobar Islands. J. Andaman Sci. Assoc. 10(1 & 2):44–49.

27. Das, I. 1997. Herpetological Explorations in the Andaman and Nicobar Islands. In: Herpetology '97. Abstracts of the Third World Congress of Herpetology. (Z. Rocek and S. Hart).pp: 50. Third World of Congress of Herpetology, 2–10 August, Prague.

28. Das, I. 1998. History of Herpetology in Southern Asia. In: Biology and Conservation of the Amphibians, Reptiles and their Habitats in South Asia. (ed. A. De Silva) pp: 74. Amphibia and Reptile Research Organization of Sri Lanka, Peradeniya.

29. Department of Environment and Forests (DoEF). 2003. Working plan of South Andaman forest division (For the period from 2003 to 2013), Section5. Andaman and Nicobar Administration, Department of Environment and Forests, 2003.

30. Fried, S. and R. Anex. 2004. "Case Study: Rapid Appraisal of Environmental and Social Threats to Havelock Island. A Brief Assessment of the Potential Impact of Proposed Regulatory Changes for the Andaman and Nicobar Islands" Point Zero, Noumea, New Caledonia.

31. Geological Survey of India (GSI). 2004. Investigation of effects of the Sumatra – Andaman earthquake, 26th December 2004 in Andaman and Nicobar Islands. Geological Survey of India, Central Headquarter, Kolkata.

32. Indian Council for Agricultural Research (ICAR) 2005. Road Map for the Development of Fisheries in ANI. Fisheries Division, Indian Council for Agricultural Research.

33. Indian Institute of Technology (IIT). 2005. Learning from Earthquakes: The Great Sumatra Earthquake and

34. Indian Ocean Tsunami of December 26, 2004. Indian Institute of Technology, Kanpur, April 2005.

35. Institute of Ocean Management (IOM). 2003. ICZM Plan Preparation for Selected Islands of Andaman, Executive Summary (Draft), Institute of Ocean Management, Anna University, Chennai, October 2003 Sponsored by MoEF, GOI.

36. Khatri, T.C. 1993. Butterflies of the Andaman and Nicobar Islands: Conservation Concerns. Journal of Research on the Lepidoptera 32:170–184

37. Kulkarni, S. 2000. Coral reefs of the Andaman and Nicobar Islands. Kachhapa 3:24–27.

38. Kulkarni, S. 2003. Spatio-Temporal Changes in Coral Community Structure in M.G. Marine National Park, Andaman Islands. Ph.D thesis submitted to the University of Pune.

39. MacArthur, R.H. and E.O. Wilson. 1967. The Theory of Island Biogeography. Princeton University Press, Princeton, New Jersey.

40. McCloskey, J., S.S Nalbant and S. Steacy, Indonesian earthquake: Earthquake risk from co-seismic stress Nature 434 291, DOI: 10.1038/434291a, 2005.

41. Ministry of Environment and Forests (MoEF). 2004. MoEF Annual report 2003-2004, Chapter

4 – Environmental Impact Assessment. Available at: www.enfor.nic.in.

42. National Institute of Public Finance and Policy (NIPFP). 2005 a. Infrastructure, DRAFT State Development Report of Andaman and Nicobar Islands, 2005, Chapter 3.

43. National Institute of Public Finance and Policy (NIPFP). 2005 b. Forestry, DRAFT State Development Report of Andaman and Nicobar Islands, 2005, Chapter 3.

44. National Institute of Public Finance and Policy (NIPFP). 2005 c. Tourism, DRAFT State Development Report of Andaman and Nicobar Islands, 2005, Chapter 3.

45. Sankaran, R., H.V. Andrews, and A. Vaughan. 2005. The Ground Beneath the Waves: Post-tsunami Impact Assessment of Wildlife and their Habitats in India, Volume 2: The Islands, Conservation Action Series 20050904.

46. Sekhsaria, P. 2005. Comments on the draft State Development Report, 2005. Pankaj Sekhsaria, Kalpavriksh.

47. Sirur. H.H. 1999. A Rapid Socio-Economic Assessment of Threats to the Coastal Environment and Their Root Causes in Andaman and Nicobar. GOI/UNDP/GEF PDF B Project Management of Coral Reef Ecosystem of Andaman and Nicobar Islands. 75 pages.

48. Sridhar, A. 2005. Statement on the CRZ Notification and Post Tsunami Rehabilitation in Tamil Nadu (Final Revised Draft for Review) March 2005, ATREE-UNDP.

49. Stattersfield, A.J., M.J. Corsby, A.J. Long, and D.C. Wege. 1998. Global Directory of Endemic Bird Areas. Cambridge, UK: Birdlife International.

50. World Wildlife Fund (WWF). 1997. The Coral Reef Ecosystem of the Andaman and Nicobar Islands: Problems and Prospects and the World Wide Fund For Nature - India Initiatives for its Conservation by Krishna Kumar (Biodiversity Hotspots Conservation Programme (Andaman and Nicobar Islands segment) WWF-India, New Delhi - Paper presented at the Regional Workshop on the Conservation and Sustainable Management of Coral Reefs, December 1997.

Website References

1. www.andaman.nic.in - Official website of the Andaman and Nicobar Administration, referred for general introduction and various statistics.

2. www.fao.org, The Coral Reef Ecosystem of the Andaman and Nicobar Islands : Problems and Prospects and the World Wide Fund For Nature - India Initiatives for its Conservation by Krishna Kumar (Biodiversity Hotspots Conservation Programme (Andaman and Nicobar Islands segment) WWF-India, New Delhi - Paper presented at the Regional Workshop on the Conservation and Sustainable Management of Coral Reefs, December 1997 ,

3. www.ourplanet.com, Small Islands, Measuring vulnerability, Lino Briguglio,1999

4. www.eeri.org , Learning from Earthquakes, The Great Sumatra Earthquake and Indian Ocean Tsunami of December 26, 2004 , Indian Institute of Technology, Kanpur , EERI Special Earthquake Report, April 2005.

5. http://www.worldwildlife.org/- Terrestrial Eco Regions › Indo-Malay › Tropical and Subtropical Moist Broadleaf Forests ›Andaman Islands rain forests (IM0101)/ Nicobar Islands rain forests (IM0133)

6. http://www.andaman.org/book/ Fried S. and Anex R. A brief assessment of the potential impact of proposed regulatory changes for the Andaman and Nicobar Islands, 2004

7. www.envfor.nic.in, MoEF Annual report 2003-2004, Chapter 4 – Environmental Impact Assessment

8. http://www.envfor.nic.in/legis/legis.html for Coastal Regulation Zone Notification, 1999 and subsequent amendments

9. www.forest.and.nic.in, Department of Environment and Forests, Andaman and Nicobar Administration

10. www.asthabharati.org/Dia_Apr03 Conserving the Biodiversity in Andaman and Nicobar Islands, Dr. Vasumathi Sankar, Astha Bharati., Dialogue April - June, 2003, Volume 4 No. 4,

11. http://www.nipfp.org.in/seminarfile/SDI/ Draft State Development Report of Andaman and Nicobar Islands, 2005, National Institute of Public Finance and Policy

PLATE 1
1 of about 550 of Andaman islands

PLATE 2
Tropical forests, Wandoor

PLATE 3
Mangrove forests, Diglipur, N. Andamans

Plate 4
Ramnagar beach, N. Andamans

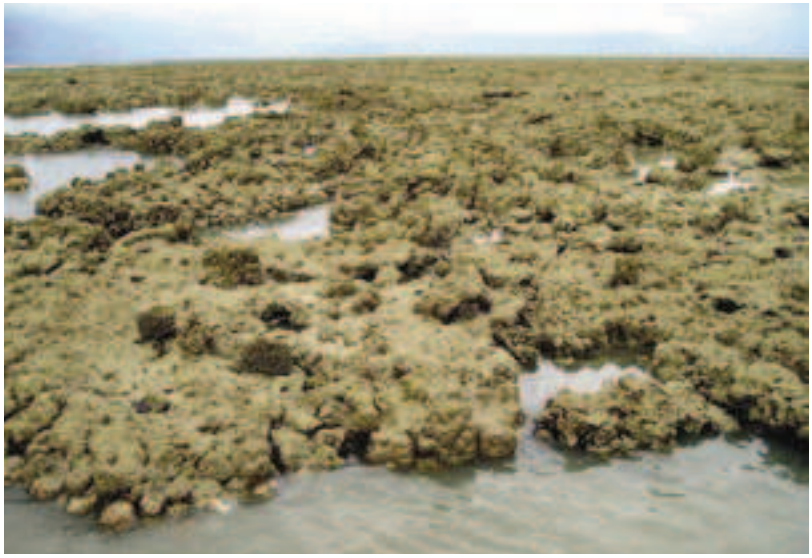


Plate 5
Exposed coral reefs near Smith & Ross Islands, N. Andamans

Plate 6
Exposed coral reefs near Smith & Ross Islands, N. Andamans

Plate 7
Fishing activities, Diglipur, N. Andamans

Plate 8
Habitations close to sea, Mayabunder,
Middle Andamans

Plate 9
Development activities, Mayabunder,
Middle Andamans

Plate 10
Tourism infrastructure, Middle Andamans

Plate 11
Compound wall of Dolphin Resort, Havelock Island in close proximity to the tidal area.

Plate 12
Stones, corals and shells being used to pave paths in a beach resort in Havelock Island

Plate 13
Road construction in Havelock Island; note sedimentation. Such activities kill corals by choking them with sediments

Plate 14
Tourism infrastructure at Radhanagar beach, Havelock Island

Plate 15
Sea water entering jetty at Port Blair during high tide because of land submergence after earthquake of 26 Dec'05

Plate 16
Construction of dykes south of Port Blair to control entry of sea water

Plate 17
Quarrying of mud south of Port Blair probably for building dykes

Plate 18
Tsunami relief houses constructed near Stewardgunj

Mangroves & tropical forest, North Andamans

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